Amateur Radio

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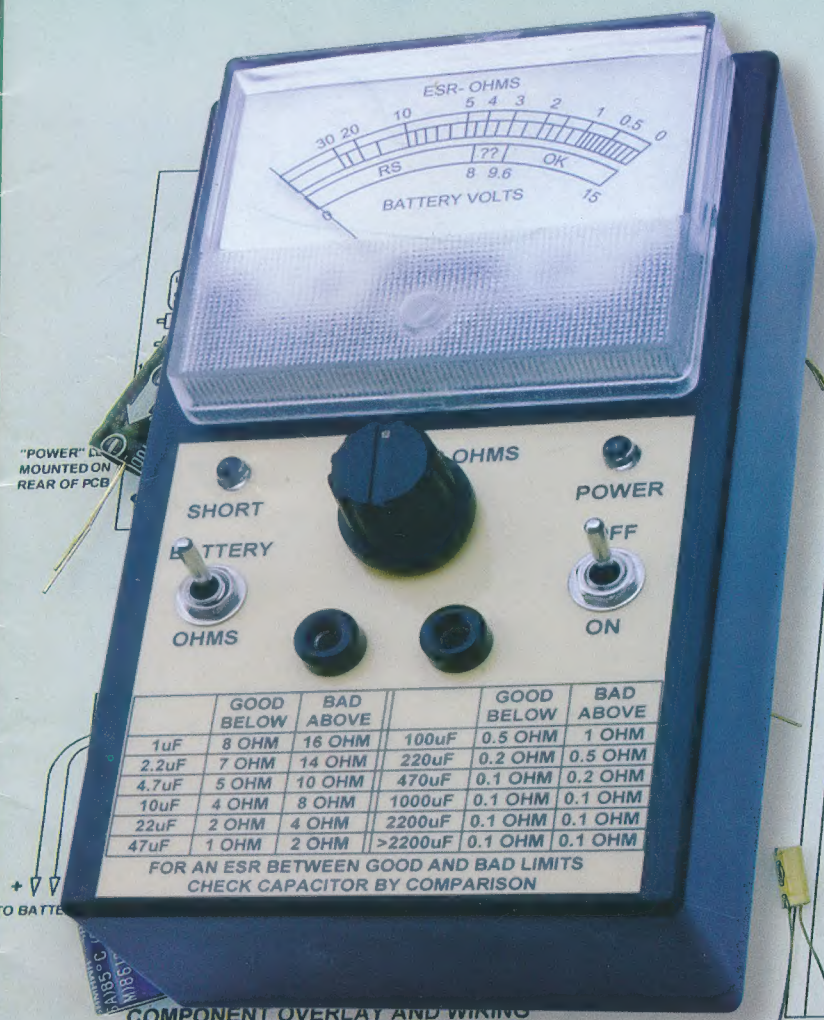
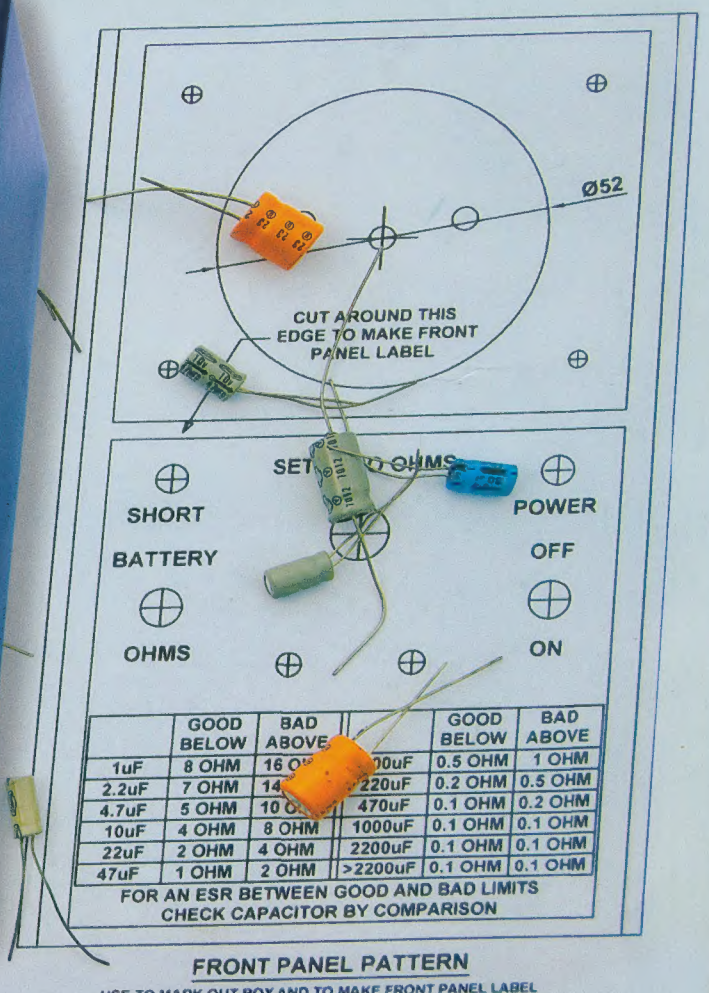


	GOOD BELOW	BAD ABOVE		GOOD BELOW	BAD ABOVE
1uF	8 OHM	16 OHM	100uF	0.5 OHM	1 OHM
2.2uF	7 OHM	14 OHM	220uF	0.2 OHM	0.5 OHM
4.7uF	5 OHM	10 OHM	470uF	0.1 OHM	0.2 OHM
10uF	4 OHM	8 OHM	1000uF	0.1 OHM	0.1 OHM
22uF	2 OHM	4 OHM	2200uF	0.1 OHM	0.1 OHM
47uF	1 OHM	2 OHM	>2200uF	0.1 OHM	0.1 OHM

FOR AN ESR BETWEEN GOOD AND BAD LIMITS
CHECK CAPACITOR BY COMPARISON

COMPONENT OVERLAY AND WIRING
FOR ESR TESTER

VK5JST SEPT. 2011



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FOR AN ESR BETWEEN GOOD AND BAD LIMITS
CHECK CAPACITOR BY COMPARISON

FRONT PANEL PATTERN
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An ESR meter for electrolytic capacitors

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The radio... YAESU

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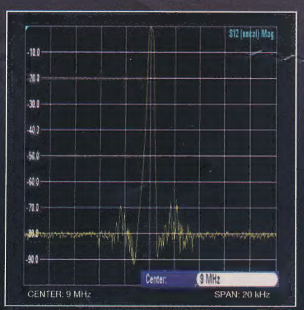
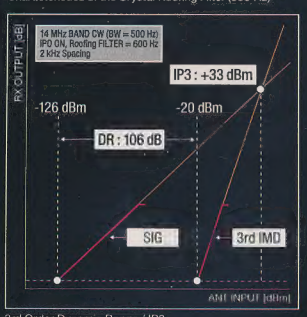


Characteristics of the Crystal Roofing Filter (300 Hz)



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This month's cover

In this issue we have two useful items of test equipment that you can build. The cover features one of these projects – an ESR meter by Jim Tregellas VK5JST. See the story starting on page 18. Background photo by Peter Freeman VK3PF, photo of the completed ESR meter by Jim Tregellas VK5JST, composite image compiled by Sergio Fontana VK3SFG.

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Contributions to Amateur Radio

Amateur Radio is a forum for WIA members' amateur radio experiments, experiences, opinions and news. Manuscripts with drawings and/or photos are welcome and will be considered for publication. Articles attached to email are especially welcome. The WIA cannot be responsible for loss or damage to any material. Information on house style is available from the Editor.

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Disclaimer
The opinions expressed in this publication do not necessarily reflect the official view of the WIA and the WIA cannot be held responsible for incorrect information published.

Amateur Radio Service

A radiocommunication service for the purpose of self-training, intercommunication and technical investigation carried out by amateurs; that is, by duly authorised persons interested in radio technique solely with a personal aim and without pecuniary interest.

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Editorial

Peter Freeman VK3PF

Winter activity

The weather in the past month has definitely been very wintery, especially here in VK3. The lawns are like water-soaked sponges. There has been little progress on the many projects on the to-do list. I have been keeping an ear out for the few SOTA expeditions around Victoria, with mixed success. A combination of propagation conditions and high noise levels experienced on the HF vertical antenna has meant that I have missed more summit activations than I have worked. I had a chance to head to the hills on a week day, with the weather excellent – sunny but cool, with only a gentle wind. After a long walk to the summit of choice, the antenna was erected and the station set up. Unfortunately, propagation was against me and I only completed two contacts over about 90 minutes of calling and searching. So no SOTA points – I will need to revisit the summit for another activation attempt and hope to gain the minimum four contacts to gain the points.

I have been undertaking some planning with regards to revising some of the microwave equipment: building a more modern 10 GHz transverter is high on the list, as is finally completing some kits and integrating the various modules for a 24 GHz transverter. And of course, to chase the neighbours for some paperwork for Council approval to erect a mast or two in the yard and to finally erect some Yagis for the VHF and UHF bands for operations at home!

Welcome aboard

I am delighted to welcome Chris Chapman VK3QB and Luke Steele VK3HJ to the *Amateur Radio* team. Chris and Luke have jointly volunteered to undertake the collation of the **DX News & Views** column following the retirement of John VK4OQ. I am reliably informed that both amateurs are active in the DX scene and are held in high regard. Luke has been part of the *AR* proofing team since April, playing an important role in our quality control processes. Both serve on the WIA VK3 Advisory Committee. The Publications Committee (PubCom) is allowing them a "trial" run, so that the contributors can become familiar with the workload of assembling the column with its monthly deadlines and the Committee can observe their progress. I am confident that PubCom will find their work up to the mark, based on my reading of their first column.

Chris and Luke have their first column appearing in this issue and I expect that they will tell all readers a little more about themselves in upcoming issues. The trial allows Chris and Luke to opt out – I trust that do not find the task too onerous.

New columns?

Are you involved in an aspect of our hobby which does not receive regular coverage in *Amateur Radio?* Do you have enough expertise to contribute an occasional column on a regular basis – not necessarily monthly?

Continued on page 5

WIA comment

Michael Owen VK3KI

The WIA and Clubs

During the week I write this Comment the WIA office will be sending to the President of each affiliated club a letter from me.

So, by the time you read this, every club should have that letter.

Why write to the clubs?

We think we have a common problem.

Over the last six to 12 months there has been a marked fall-off in the number of people seeking to enter amateur radio or at least a marked fall-off in the number of exam packs that the WIA has been asked to process.

The first Foundation licence exams were conducted in October 2005, which is almost seven years ago. It was to be expected that there would be many seeking the new Foundation licence in the first few years of its availability. There was a pent-up demand, particularly as the Novice amateur qualification was seen as quite difficult. Also, as the clubs in different parts of Australia had Assessors qualified at different times, the resource to train and qualify potential amateurs was initially restricted, so that demand could not be initially met.

But the fall-off has a rather unfortunate consequence.

The WIA is bound to follow the Commonwealth's cost recovery guidelines. Some costs associated with the examinations remain the same, whether we handle 10, 100 or 1,000 exams. The only difference is that cost is divided by either 10, 100 or 1,000 to determine the cost per exam.

So, the cost per exam of those fixed costs increases and so the cost for an exam must increase. No doubt, the more it increases the more people will argue that it all costs too much, and less people will want to be amateurs.

So, attracting new amateurs becomes important.

Promoting amateur radio and attracting new amateurs is something the clubs, particularly in regional areas, can certainly do.

But how to do it?

One of the most successful tools used during the WIA Centenary year was a Media Kit, prepared by Jim Linton. At our request Jim has updated the Kit, which now includes a basic Media Release built around any number of activities.

So, in my letter to the clubs is a hard copy of the Media Kit.

So, if a club is participating in a Field Day, or conducting an open day, or engaged in any other activity where it can seek media attention, this Kit should be very helpful.

In my letter I am telling the clubs that we will be sending a new Newsletter for clubs every two months or so. The Newsletter will have information that is of particular interest to clubs. An example, from the recent meeting of Queensland clubs in Hervey Bay is information on Scouting and amateur radio. At that meeting there was a discussion about Scouting and amateur radio. It was obvious that everyone knew a lot about amateur radio and very little about Scouting. That is the sort of information that I think will be of particular interest to clubs.

I don't know how many times I have pointed to the importance of the clubs to the WIA and the importance of the WIA to clubs (and all amateurs).

The WIA can do things the clubs cannot do individually. It is the national organisation that can represent amateur radio, national and internationally. It is the national organisation that can manage the whole examination system.

But the clubs can do what the WIA cannot do. The club can be that social attraction that brings in potential amateurs. The club can market and promote amateur radio in its own geographic area. The club can teach and qualify the new amateur and keep and enlarge that new amateur's interest.

These are the sort of reason that led the WIA Board to seek to enhance the link with the clubs.

In reviewing all of this we looked at another thing. How many members of a club were also members of the WIA? That is an issue that arises in a number of contexts. It arises when the premium for the public liability insurance of an affiliated club is calculated. (There is additional premium for every member of a club who is not also a member of the WIA.) It arises when we look at the number of members of the WIA who are members of a club seeking a grant under the WIA's Club Grant Scheme.

What struck us was the extent of the differences. There are some clubs, even quite large clubs, where most of the club members are also WIA members. There are also clubs, even quite large clubs, where very few of the club members are also WIA members.

We believe that the WIA must work with the clubs, and support the clubs, even more than we are doing now.

In return, we ask that the clubs support the WIA.

We ask the clubs to encourage their members to also be members of the WIA.

The clubs and the WIA are not competitive. Rather they are synergistic.

And synergistic is exactly what I mean. "Synergistic used especially of drugs or muscles that work together so the total effect is greater than the sum of the two."

WIA news

Hervey Bay Club hosts meeting of Queensland Clubs and amateur radio Centenary celebrations

Saturday 21 July 2012 saw a successful meeting of WIA affiliated Queensland radio clubs and the following day the host club, the Hervey Bay Amateur Radio Club conducted a barbeque celebrating the centenary of the formation of the club that ultimately became part of the WIA.

Organised amateur radio in Queensland started in 1912 at a meeting organized by Sydney Victor Colville where the Wireless Institute of Queensland was formed, later to become the Wireless Institute of Australia, Queensland Division.

The WIA's Queensland Advisory Committee had organized the special event station VK100WIQ around this weekend.

Representatives of 11 clubs, from Ipswich, Caboolture, Southside, Townsville, Hervey Bay, Bundaberg, Maryborough, Bayside, Gold Coast, Lockyer, Rockhampton and Sunshine Coast participated in the meeting, led by WIA President Michael Owen VK3KI and with WIA Directors Ewan McLeod VK4ERM and Trent Sampson VK4TS participating.

The recent and the forthcoming World Radiocommunication Conferences were discussed, as were the arrangements being made to deal with the withdrawal of the 420 to 430 MHz sub-band.

The apparent plateau in the number of new entrants seeking to qualify as radio amateurs was a major issue discussed, and in particular, the role of the clubs in attracting, training and qualifying new amateurs was seen as important.

A revised media kit with a forward looking pro forma release adaptable for many club activities promised by the WIA was seen as very important.

Presentations included one on participating in the RD contest by Alan Shannon and one on the history of radio in Queensland by Ken Fuller.

The Hervey Bay Amateur Radio Club led by President Norm Greenaway invited Fraser Coast Regional Council Mayor Gerard O'Connell to attend the Club's barbeque on Sunday, and he listened to a number of presentations.

In responding to Norm's welcoming remarks, Councillor O'Connell said that he was pleased to learn more about amateur radio which was obviously an important part of the community.

Also participating in the weekend were Queensland Advisory Committee Chairman Michael Charteris, and members Alan Shannon and Don Wilschefski.

VK4ZZ Presented with Chris Jones Award

One important presentation took place on 21 July 2012 at the meeting of WIA affiliated Queensland radio clubs hosted by the Hervey Bay Amateur Radio Club.

Gavin Reibelt VK4ZZ from the Townsville Amateur Radio Club had been announced as the recipient of the Chris Jones Award at the WIA Annual Conference in Mildura at the end of May, but as he was not at Mildura, WIA President Michael Owen VK3KI presented Gavin with the Award during the meeting of clubs.

In doing so, Michael paid tribute to the contribution of Gavin to amateur radio in many different ways.

David Rowe VK5DGR

VK5DGR to receive ARRL Technical Innovation Award

The ARRL Board has awarded the 2012 ARRL Technical Innovation Award to David Rowe VK5DGR for his work on the amateur radio Codec2 low bit rate speech codec.

The ARRL Board minutes for July 20-21 say:

"32. On motion of Mr. Norris, seconded by Dr. Weaver, the following was ADOPTED with applause:

Whereas David Rowe, VK5DGR, has been a major leader and the primary technical author of an open-source CODEC2 protocol, designed to address the impediment to the development of amateur digital-voice posed by closed sources protocols; and Whereas the open-source nature of this work is a major step forward in the development of digital voice communications;

Therefore, the ARRL Board of Directors awards the 2012 ARRL Technical Innovation Award to David Rowe, VK5DGR."

On hearing of his award David Rowe VK5DGR said:

"When I first became interested in Ham Radio as a 12 year old in the late 70s my grandfather bought me the 1979 ARRL handbook. Quite an honour to one day be contributing back to this fine hobby that was

my start in a communications and electronics career.

That version of the handbook even had a chapter on "Narrow Band Voice Modulation" - an esoteric analogue technique to compress speech by removing chunks of audio bandwidth. Who would have thought that 30 years later I'd be contributing in the same area..... "

India Blackouts Affects Millions

In the world's worst blackout in recent times power was cut to 700 million people in India. Jayu Bhide VU2JAU reports that the North-East grid failed due to a fault in the plant and 20 states were affected by the power failure. Work to restore the power was in progress.

National Coordinator for Disaster Communication in India, Jayu VU2JAU said that New Delhi had its power cut for 12 hours. He said in the evening power was restored to some parts of Delhi and the surrounding areas.

"Hams in and around the affected areas were ready for the emergency communication required during power cuts," said Jayu VU2JAU. They provided emergency communications during the outage, all voice repeaters were in order and did not fail despite the heavy duty back-up power needed. He said, "Hams will still be on their toes until complete power is restored."

Editorial

Continued from page 2

If so, then please drop me an email together with an outline of your ideas.

The Publications Committee is keen to broaden the scope of topics covered in our regular columns. The frequency of the contribution is up to whoever accepts the challenge – it could be monthly, bimonthly, quarterly or even simply an occasional contribution. Each contribution should ideally be about one or two pages, including any images. As a guide, one page in the magazine is around 750 words plus one image.

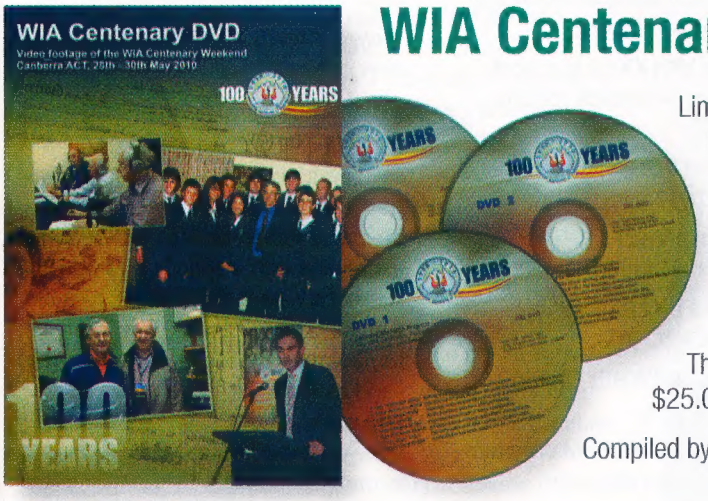
Club News

I sometimes receive comments about having more Club news in *AR*. I would welcome more Club news, but please do not all send them in at once. We have many clubs around the country and we do not have sufficient page space for news items from them all. Readers will be aware that we have regular contributors from VK2, VK6 and VK7 who each collate a summary of news items from clubs around the state each month. This arrangement seems to work well, as any club simply needs to forward key news items to the regional scribe, who then collates the news items into a single state-wide news summary.

Of course, we can also publish items from individual clubs, as long we only have a small number of such contributions each month.

So if you are from a club in either VK3 or VK4, perhaps you need to be suggesting to the relevant Advisory Committee that a scribe be sought to collate the news items for that state. Once a scribe has been found, it will then be up to the clubs in that state to provide the information to the scribe. We had a VK4 correspondent in the past, but he gave up due to the lack of incoming news! The alternate is for your own club to **occasionally** contribute a small story for publication.

Cheers,
Peter VK3PF



WIA Centenary DVD

Limited numbers of the **WIA Centenary DVD** are now available for purchase. This professionally recorded and produced three DVD boxed set includes footage from the Historic Presentations, Centenary Dinner, live VK100WIA news broadcast, plus Sundays visit to Dick Smith's property.

The boxed set of three DVDs is available for just $25.00 plus postage.

Compiled by Ralph VK3LL, Jack VK3WWW and Robert VK3DN.

GippsTech 2012 review

Roger Harrison VK2ZRH

Held over 7-8 July this year, the annual Gippsland Technical Conference – GippsTech – should need little introduction on this forum site, but for the sake of new registrants, the event *has a well-recognised reputation as the premier technical conference in VK, with its focus primarily on techniques applicable in the VHF, UHF and microwave bands, especially for weak-signal contacts. In addition to the Conference, a Partner's Tour . . . is. . . conducted, together with an informal social gathering for dinner on Friday and a Conference Dinner on Saturday.*

That sums it up nicely.

The short story

If you didn't go, you missed *another* good one!

The long story

Reprising the arrangement of my GippsTech 2011 review, this year's itinerary of topics is listed below, in alphabetical order by presenters' first names. I use the word 'itinerary' deliberately, for attending the presentations at GippsTech is indeed a journey. It's a journey from anticipation to inspiration, from despair ('I'll *never* get around to that!') to elation ('*I* can do that!').

Alan Devlin VK3XPD and Michael Coleman VK3KH: 78 GHz and Up!! An alternative, simple approach to millimetre wave homebrewing.

Andrew Davis VK1DA: Publish your radio projects on the web, in three easy steps.

Andrew Martin VK3OE: Es backscatter Doppler shift measurements using CW and chirp radar techniques.

Chris Skeer VK5MC: Update on SDR in EME applications.

Colin Hutchesson VK5DK and Gary Smythe VK5JR: Converting ex analogue TV (Tx) equipment for use on the amateur bands.

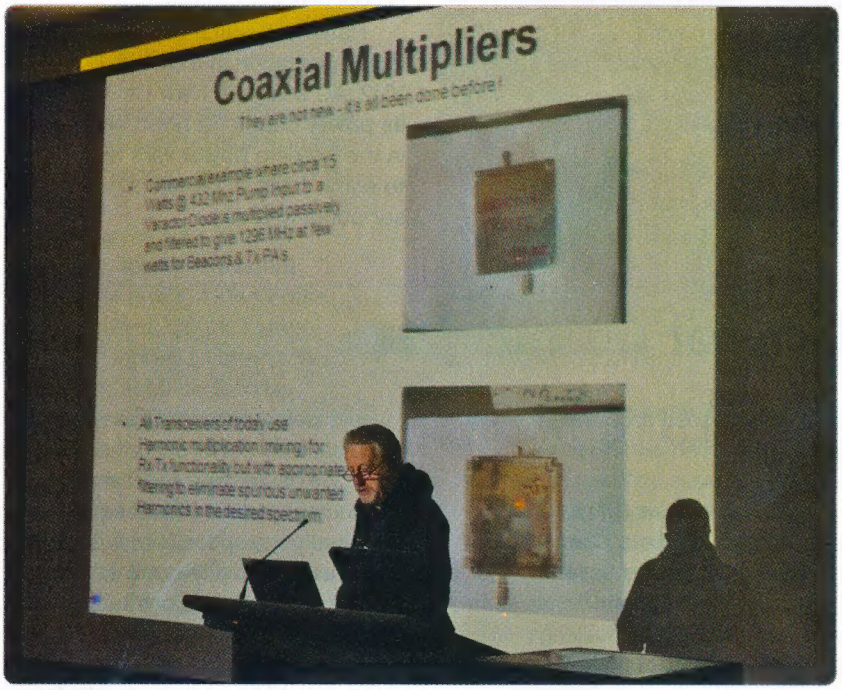


Photo 1: Michael VK3KH during the presentation on transverters on the bands 78 GHz and higher.

Dale Hughes VK1DSH and Peter Young VK3MV: WRC-15 issues for amateurs.

Doug McArthur VK3UM: New software from VK3UM.

Glen English VK1XX: DVSSB - A PC based digital speech mode that rivals SSB above 30 MHz.

Glen English VK1XX: A low cost GPS frequency reference for any radio.

Jim Collins VK3ZYC: Reference locking the FT817.

Michael Farrell VK2FLR: The Marconi Poldhu Station.

Neil Sandford VK2EI: Digital interface for the IC-706.

Ralph Edgar VK3WRE: Cheap preamp for 10 GHz.

Ralph Edgar VK3WRE: Microwave power amplifier construction.

Ralph Edgar VK3WRE: 10 GHz rainscatter.

Rex Moncur VK7MO: 24 GHz terrestrial propagation.

Roger Harrison VK2ZRH: Long-range ionospheric DX on 6 m and 2 m - new angles on success.

Russell Lemke VK3ZQB: Stepping in it.

Wayne Merry VK3WAM: SOTA - a new challenge.

The talks

78 GHz and up!! An alternative, simple approach to millimetre wave homebrewing: Michael VK3KH gave the presentation as Alan VK3XPD was in hospital with a serious thrombosis. A bit of a worry! Anyhow, Michael did a sterling job explaining how Alan turned many high-speed diodes into sand making millimetre wave mixers and worked out a scheme to ensure that you *know* you're tuning the correct frequency with your IF rig –

the 'frequency truth table' (that one will have to enter the microwaver's lexicon). Michael gave a detailed description of Alan and his recent record-setting contacts on the bands from 78 GHz to 324 GHz, with comprehensive pictorial views of the paths used. Inspiring! Understandably, the paths on 122 GHz, 241 GHz and 324 GHz are quite short. (Shades of 'Can you hear me?', 'Yes. But not on the radio')!

Publish your radio projects on the web, in three easy steps: In his inimitable, gently humorous style, Andrew VK1DA gave a step-by-step account of how to put your project perorations on the web without having to first learn about HTML, PHP, DNS or SQL. The secret is WordPress. Sheesh, Andrew. Why didn't I think of doing that? (Slaps forehead, utters a silent D'Oh!). And: What's more, your stuff doesn't have to look or work like a blog.

Es backscatter Doppler shift measurements using CW and chirp radar techniques: The indefatigable Andrew VK3OE has been chirping away and catching the results at his solar-powered remote site at Harcourt in central VK3. Since launching his *Bistatic Backscatter Chirp Radar for amateur radio use* in 2010, Andrew has recorded some quite remarkable, and significant, propagation on 6 m and the HF bands. He gave the audience a rundown on a 6 m sporadic E event recorded in November 2011, which played a part in non-direct path 6 m contacts from VK3/VK7 to VK6. The Es cloud responsible showed considerable turbulence, with backscatter signals having clear Doppler shift and spreading. Sorting out reflections from Doppler clutter proves to be a real art. In addition, Andrew revealed to the 100+ throng an example of 7-hop 28 MHz Es and another displaying around-the-world echoes guided by the F-layer. . . one echo at 40,000 km (once around), followed by another at 80,000 km (twice around)!

Update on SDR in EME applications: This was a short, impromptu presentation from Chris Skeer VK5MC – the man with the 'dirty great dish'. It was by way of a follow-up from the one he gave at the 2011 GippsTech. Chris showed how he has achieved VHF EME 'on a budget' based on a low-cost SDR kit. Cheap, cheerful, practical and successful!

Converting ex analogue TV (Tx) equipment for use on the amateur bands: Colin VK5DK and Gary VK5JR raided decommissioned analogue TV broadcast sites and promptly went about converting solid-state transmitter modules for use on 6 m and 2 m. One conversion involved heavy machinery to saw a module and heatsink in half. Talk about dedicated! Their presentation was not only practical, but entertaining. Naturally, the audience was regaled with DX opportunities that were missed. The finished products were available for inspection during coffee and lunch breaks and Colin and Gary were deluged with questions. Noice kit (as they say in the classics)!

WRC-15 issues for amateurs: Serious stuff. Bands from 70 cm on up are under threat. Dale VK1DSH had a clashing commitment, so Peter VK3MV gave the presentation. People paid close attention as some perspicacious

Electronics Enthusiasts

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Refer Silicon Chip Magazine July 2012
Stops that dangerous kick-back when you first power up an electric saw, router or other mains-powered hand tool. This helps prevent damage to the job or yourself when kickback torque jerks the power tool out of your hand. Kit supplied with PCB, silk screened case, 2m power cord and all specified electronic components. Soldering and construction required.

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questions were asked. Protecting and enhancing our bands is 'core work' of the WIA. They're onto it.

New software from VK3UM: Doug regaled us with highlights from the latest updates to his software suite for serious VHF/UHFers and moonbouncers. It all reminds me of the petrol head and DIY car enthusiast who installed an electronic ignition and engine management system he developed to gain 17 per cent more fuel efficiency, fashioned a new exhaust manifold and extractor system to get a 10 per cent engine efficiency improvement, adjusted the overhead cams for peak acceleration performance and so on, and so on. 'How'd it go?' his mate asked. 'It's a bit of a problem' he replied. 'I went for a 10 km drive on Sunday and the petrol tank overflowed.' See it all on *http://www.vk3um.com/*

DVSSB - A PC based digital speech mode that rivals SSB above 30 MHz: Now here was something *entirely* new. Revealed to an unsuspecting world at GippsTech 2012! Glen VK1XX has applied his noggin to the perennial problem of weak-signal speech readability. Could be something in it! Glen played some sample audio clips. OK for blokes, doesn't do as well on female's voices, yet. It'll be interesting to hear how it performs on meteor scatter, gender notwithstanding. Is this a solution looking for a problem? Glen can't abide the sound of SSB, especially the way some operators tune it in. Grates the teeth, apparently! Seems to me Glen will have to do a lot of 'selling' the concept and the practical technology if it's to succeed in displacing SSB as the most 'popular' voice mode. More power to his skinny elbow.

A low cost GPS frequency reference for any radio: Glen VK1XX described what looks like an elegant engineering solution to a common problem in GPS-locking a rig - the diversity of digital synthesizer reference oscillator frequencies among rigs. And he's appealed to the Scottish propensity for thrift that runs in all hams' veins with a design based on a versatile, low-cost chip. It will be interesting to see how this idea gets taken up among the rig-locking fraternity.

Photo 2: A view of part of the audience of just over 100 amateurs during question time in the course of one of the conference technical sessions.

Reference locking the FT-817: Jim VK3ZYC presented a more-or-less elegant solution by developing a system that is housed in the (cramped) FT-817 case. It sparked a lot of questions and discussion and could be on the way to becoming a widely-adopted solution (in one form or another).

The Marconi Poldhu Station: Mike VK2FLR went back to where it all began (near enough), the site of Marconi's wireless station at Poldhu in Cornwall. Judging from the short video Mike showed, it's a cold, bleak, treeless, misery-guts of a site. Popular with German and Australian tourists, apparently! Mike produced a brick shard from Marconi's station building, which the MC auctioned off, with the proceeds going to the Eastern Zone ARC. It was knocked down for $30. History in your pocket!

Digital interface for the IC-706: Whenever Neil VK2EI puts up a presentation at GippsTech, it's always about simple, low-cost solutions to real problems. The sort of stuff that's endemic to fiddling with weak-signal communications on the higher bands. This was another graceful example in a long chain of such presentations. A collection of GippsTech Proceedings from past years is invaluable for these gems alone.

Cheap preamp for 10 GHz: Ralph VK3WRE must have adopted the Nike slogan before Nike was in kneepants: *'Just do it!'* He found a low-cost dual LNA PCB available from a web supplier that offers remarkably good performance and is simple to adapt to an amateur 10 GHz system. A gem.

Microwave power amplifier construction: Another gem from Ralph VK3WRE. If the microwave bands strike your fancy, even modestly, this sort of stuff is why you would go to GippsTech. Along with his 10 GHz preamp presentation, I had one of those *'I can do that!'* epiphanies.

10 GHz rainscatter: The 'proof of the pudding' goes the old aphorism, 'is in the eating'. And this was it. Ralph VK3WRE demonstrated video/audio of contacts via rainscatter, one of the reasons for mucking about on the microwave bands. Inspiring stuff, indeed.

24 GHz terrestrial propagation: The perpetually peripatetic Rex VK7MO has tirelessly pursued his penetration of the microwave mystique. And he's always willing to share his insights and experiences. The meat, the potatoes *and* the gravy. Lap it up at GippsTech.

Stepping in it: Russell VK3ZQB evinces the air of the professional engineer: knowledgeable, experienced and bluntly pragmatic. His presentations reflect that, and always have an edge of wry, laconic humour. Stepper motors was his subject this year. We got a taste of theory, a soupcon of high technology, and a bouillabaisse of practical experience in swinging dishes in microwave home stations. Hmmmm. Something to file away as 'going to be useful when I get up to that'.

Long-range ionospheric DX on 6 m and 2 m - new angles on success: I presented an analysis of those magic days of 6 m and 2 m DX in January and how antenna installations and configurations contribute to success where the elevation radiation angles of the antennas closely match the raypath elevation angles of the DX propagation. I was pleased to get feedback from Ken Jewell VK3AKK (whom I first met in the 1960s), who said, 'That was the best lecture I ever heard you give.' As I hadn't laced it with art, science, technology and tomfoolery (as is usual), I gather Ken appreciates the absence of music clips and mathematics.

SOTA - a new challenge: Summits On The Air – for those unfamiliar with the acronym. If you like to challenge yourself in the great outdoors – *and* make some contacts on the amateur bands – SOTA is worth a close look, enthused Wayne VK3WAM. There are awards to be won, too, although SOTA is not a 'contest' in itself. Another aspect, and proof of the enormous diversity, of the great hobby of amateur radio.

And the event itself: GippsTech succeeds because the organizers look after the details as much as they look after the focus of the event. In 2011, they introduced two new things: coffee mugs for everyone and pizza for Sunday lunch. Brilliant! This year, the coffee mugs came with a GippsTech logo. Saturday lunch is best described as country roasts, with salad sides. Hearty. Basic. Does the job. Let them know your victual sensitivities when you register and they'll ensure vegetarian and gluten-free options are available for you. Looking after the details. You can find follow-up details on the Eastern Zone ARC's website at: *http://www.vk3bez.org/gippstech.html*

The Partners' Tour is a side-benefit feature of GippsTech. My wife, Val, has 'done' the partners' tour each year for the past few GippsTechs that we've attended together. She gave it a big thumbs-up for this year.

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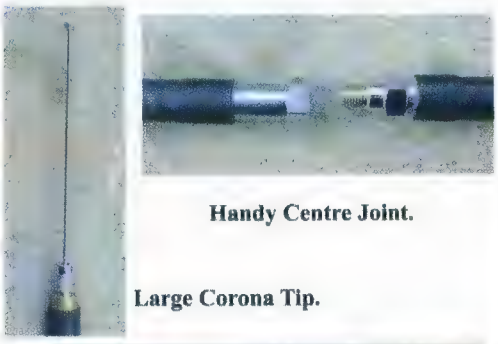

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76 GHz and 122 GHz in a single transverter

Alan Devlin VK3XPD

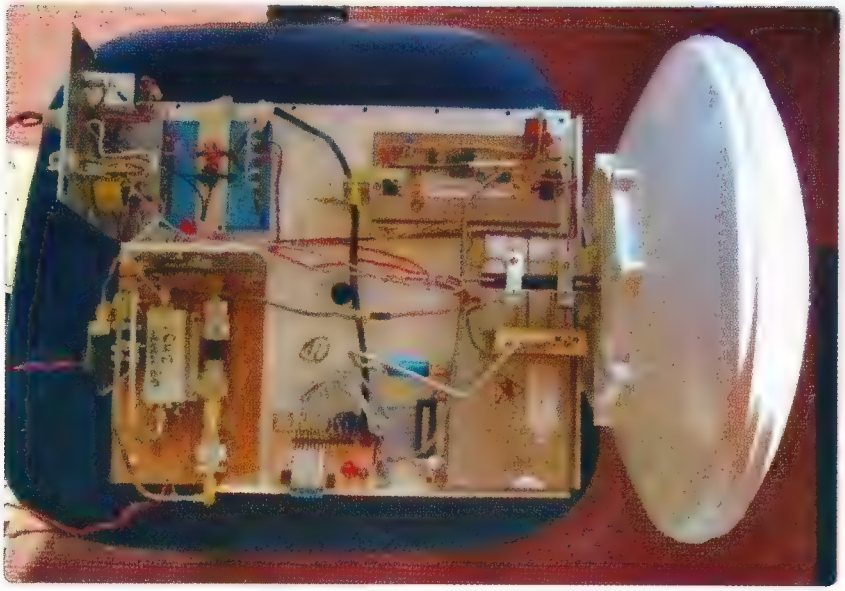

Figure 1: The homebrew prototype transverter.

After reading an article (1) written by Kerry Banke N6IZW, I became enthused with building gear for 47 GHz. It was not long however before I realised I had all the parts needed to build a 76/78 GHz transverter instead. This homebrew, prototype transverter is, with just one exception, **all** coaxial.

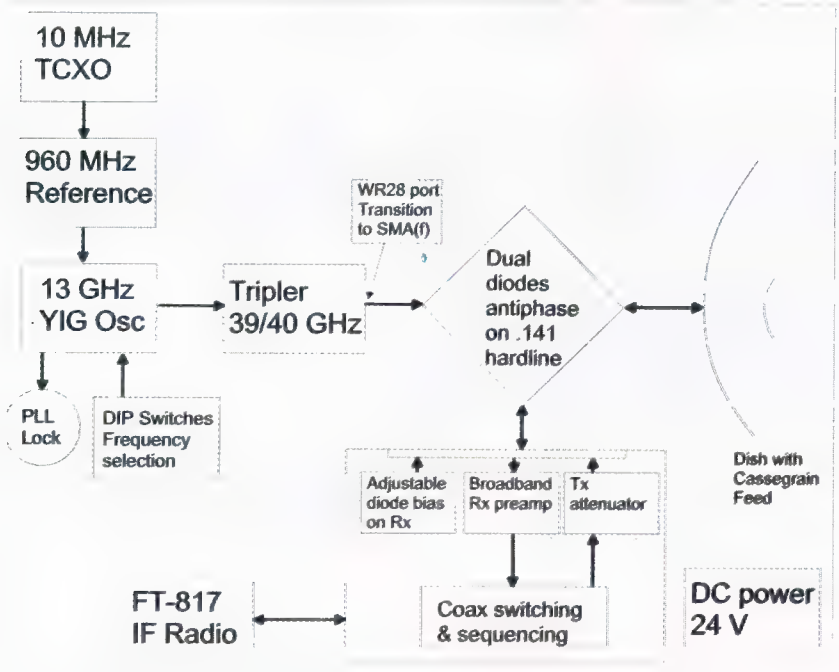

Diagram 1: The 76 GHz/122 GHx block diagram.

Two prototype transverters, as seen in Figure 1, were designed and built all within the space of four weeks. They still look a bit rough but of greater importance to me is that they 'work' amazingly well!

Referring to the block diagram, each transverter consists of a DIP settable, Microsource 26 GHz YIG oscillator. This brick requires a 960 MHz reference which is then TCXO locked back to 10 MHz. By removing the internal passive doubler, this now 13 GHz brick delivers up to +16 dBm to drive a X3 or X4, 39/40 GHz multiplier (CMA382400AUP) delivering circa 100 milliwatts or +20 dBm. This multiplier is mounted upper right on the heatsink. Some of you will recognise this part number as the same as Philipp DL2AM has used in his 76/122/241 GHz hardware.

After tripling, this 39/40 GHz signal exits through a WR-28 port. Aside from this WR-28 to SMA(m) transition fitted on the output port of the CMA 39/40 GHz multiplier, I have **not** used any waveguide in my hardware. The RF is then fed coaxially to pump a pair of antiphase diodes (surplus 14 GHz mixers) mounted/soldered on the end of a piece of .141 hardline. A photo of some prototype mixers I built is included later in this article.

A small flared horn is fitted over these diodes and this feed is then slid through a rear dish mount and aimed at an integrated Cassegrain reflector in the radome of a 300 mm dish. The positioning of this horn relative to the diodes is **very** critical. Correctly positioned, a performance improvement of more than 15-20 dB can be expected. Signal polarisation is still an issue, so rotating one 'feed' for optimum performance is necessary. I have no idea of the feed polarisation: Horizontal

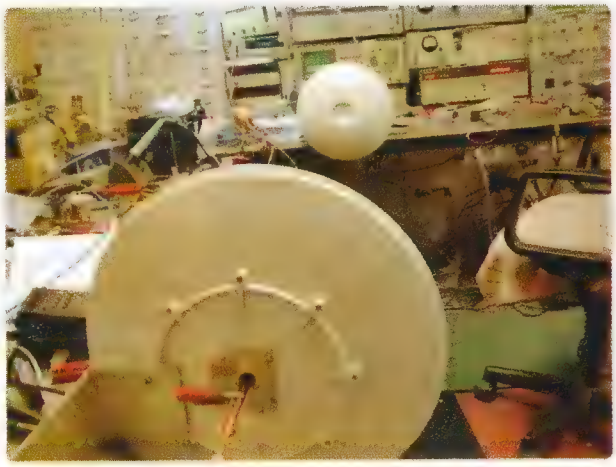

Figure 2: The Cassegrain dishes during early testing.

or vertical or offset? I would welcome comments on how I might determine the polarisation? Figure 2 shows the Cassegrain dishes during early testing.

The second harmonic of 39 GHz is, of course, 78 GHz! Figure 3 shows the unfiltered, double sideband signal; the 78 GHz centre frequency with its two sidebands, 144 MHz either side. The other signals to the right of the 78 GHz centre are 'mixer' products. They are not real!

Note: I deliberately chose to use our VK 78 GHz segment because, although the Microsource brick will function (lock) down to 12.65 GHz, I found the output of the X3 CMA382400AUP multiplier block was dropping away because it was operating at its lower frequency limit.

The IF connection for TX and RX is quite simple. Referring to Figure 4, I cut a small hole in the .141 hardline to expose the inner conductor near the SMA connector that couples to the X3 multiplier.

I then soldered the braid of a thin flexible Teflon coax (RG-174 or similar) along the side of the .141 copper jacket with the inner conductor in line/near this 'hole'. This is the IF cable. I then soldered a short but very fine piece of wire from the centre conductor of the .141 to the junction of a 1 nF capacitor and a 470 Ohm resistor. The 1 nF connects to the inner of the IF cable. DC isolation is necessary because the RX DC bias (see below) via the 470 Ohm resistor will be shunted. This thin IF connection forms an RF choke at 39 GHz, but it allows 144 or 432 MHz to pass with minimal attenuation. I have unsoldered the 470 Ohm resistor and the bypass capacitor from the .085 bias line for picture clarity.

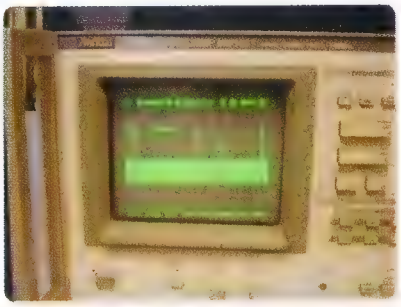

Figure 3: The unfiltered, double sideband signal.

DC bias for the diodes in RX

The multiplier diodes I have used to date are ordinary Schottky units. Transverter Rx sensitivity can be optimised considerably by setting/adjusting some nominal DC bias to these diodes. In my testing, I noticed that the optimum bias voltage is somewhat temperature dependent and the diodes may also give greater efficiency (less loss) with either + or – biasing. To achieve this, I used a 5 kΩ potentiometer with both +/- 5 volts with respect to earth on either end. The lever with the series current limiting resistor (470 Ω) connects to the centre of the antiphase diodes. Varying the pot varies the voltage plus and minus. In Figure 4, the .085 semirigid is the bias line. I also found a small decoupling capacitor on this bias line at the IF connection point to earth improves the RX signal to noise performance.

Standard coaxial relay switching is necessary

On TX, the SSB modulation from the FT-817 is switched and attenuated down to a few milliwatts. Between 0 dBm and +7 dBm works fine. I found if too much IF injection is applied, sensitivity (diode response?) is degraded giving reduced output.

On RX, a broadband RF amplifier is fitted in the RX path to improve the overall sensitivity. Figure 5 refers on next page.

Output power on 78 GHz

The absolute power level on 78 GHz is difficult to quantify. I do not think it can be measured easily.

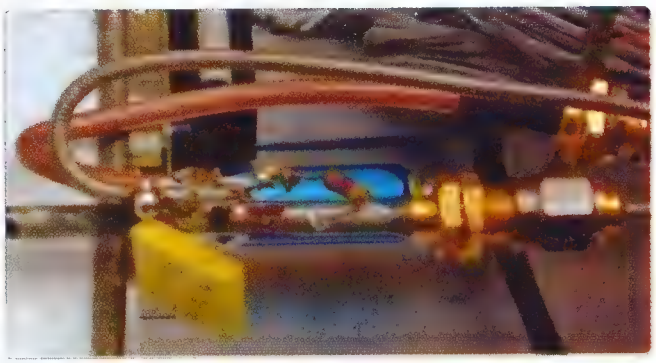

Figure 4: The IF connection.

The 'pumped' antiphase diodes are mounted on the end of the .141 hardline and pushed into the dish at/near the focal point. Therefore, there are no coaxial or waveguide connections available.

However, with both dishes pointing at each other and separated by two metres, using my homebrew uncalibrated harmonic mixers, I have measured at best on the spectrum analyser a level of

-25 dBm on 78 GHz. Suffice to say that it is a whole lot less than one milliwatt.

The first ever VK 78 GHz QSO was conducted over a 1.5 kilometre suburban path on 3 August, 2011. The operators were Alan VK3XPD and Michael VK3KH. This record was extended a few days later to circa 12 kilometres. Signal reports over this longer path were 5+1 both ways. One significant observation was quickly identified. The 'pointing' of our small 300 mm dishes is extremely sharp on these higher frequencies.

As an investigative exercise, on the shorter path, we tuned up the band to the 3rd harmonic, to 117 GHz. Although it was a very weak signal, it was quite audible. This clearly showed good prospects for operation on 122 GHz. Now, being the 'Devil's Advocate' perhaps some of you may be thinking that this could have been a 39 GHz QSO and not 78 GHz?

In the course of developing this simple transverter, I built up multiple sets/versions of homebrew harmonic mixers to test on my spectrum analyser. A sample of my prototypes can be seen in Figure 6. All these units worked OK with some variability.

I found the 'leaded' antiphase diodes make excellent harmonic mixers. For many of us, the likelihood of owning the rather expensive HP 1197X waveguide series of harmonic mixers for V, E or W bands is a 'dream'. The techniques I have described here make it **very** easy for almost anyone to build their own harmonic mixers that are usable well beyond 100 GHz.

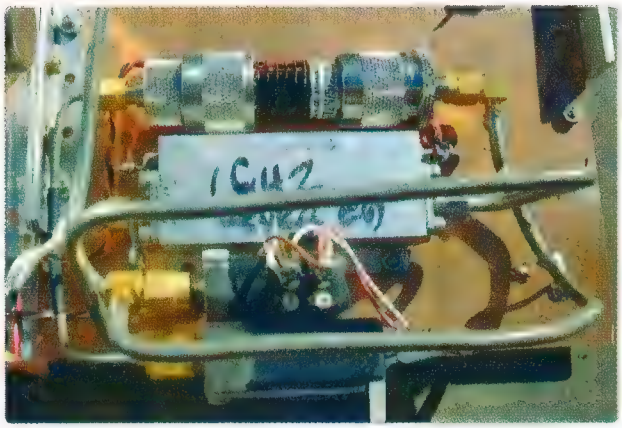

Figure 5: Showing the broadband RF amplifier in the RX path.

With my homebrew mixers, I can now easily see these 78 and 122 GHz signals. In bench testing, I have actually seen signals up to 140 GHz, the upper frequency limit of my Anritsu MS710E spectrum analyser. Not bad for 14 GHz diodes!

The absolute conversion loss may be unknown - but who cares!

It is the ability to actually 'see' and quantify these frequencies. And best of all, these 100+ GHz harmonic mixers only cost a few dollars to make.

There is another method of determining the transverter operating frequency.

I am using 10 MHz TCXOs to 'lock' the 13 GHz oscillators. There are however slight frequency differences in the TCXO frequencies. Therefore, the 'locked' 13 GHz sources are not identical in their output frequencies. Consequently, each transverter has a frequency 'offset' or difference due to these very small TCXO frequency differences. The result; my transverters have a circa 22 kHz difference between each 13 GHz oscillator.

After the X3 multiplication of these 'circa' 13 GHz signals, the frequency difference between the transverters now equates to 66 kHz for the 39 GHz Signal, 132 kHz for the doubled 78 GHz signal and finally 198 kHz for the third harmonic on 117 GHz.

For our 78 GHz QSO, one of our FT-817 IFs on two metres was simply tuned 132 kHz higher (or lower for LSB) in frequency. So, with one IF rig running a CW 'ident' on 144.150 MHz, the other IF rig was tuned to 144.282 MHz where the second harmonic 78 GHz signal should be. Logically, this also means that an IF to IF contact is **not** possible!

Interestingly, this frequency difference is an advantageous situation because if I had used GPS locking on both transverters... there would have been zero frequency offset/error. For this scenario, a 39 GHz contact (strongest signal) or worse, an IF to IF contact would have been unavoidable.

The 'multiplication' technique I have used means that the fundamental 39/40 GHz 'pump' signal is also radiated. There is an obvious benefit here.

Being much louder than the desirable second harmonic, this 39/40 GHz signal can be used for initial dish alignment/sighting and then we tune up the band to the desired second or third harmonic for 78/122 GHz, defined by the TCXO differences between the transverters.

Figure 6: The several homebrew harmonic mixers.

For shorter close in distances when testing the gear in the field, using the 39/40 GHz signal is not really necessary because the 78/122 GHz signals are so much stronger - closer in. However, over the longer distances, this technique of initially optimising our dish pointing using the stronger 39/40 GHz injection signal worked **very** well for us.

After the success we had on 78 GHz, I started looking at the possibilities for 122 GHz.

Since there is no frequency limiting waveguide used in my transverter design, both bands - 78 GHz (39.0 GHz x 2) and 122 GHz (40.6 GHz x 3) are potentially achievable with **one** transverter by simply changing the 13 GHz oscillator frequency. This is easily done by setting the DIPs switches. There was one proviso – would the 14 GHz antiphase diodes generate enough third harmonic RF on circa 122 GHz?

In VK, the 122 GHz allocation has a lower band edge of 122.250 GHz. To achieve this, the multiplier needs to deliver 40.75 GHz to the antiphase diodes. This frequency is towards the upper performance limit of the CMA382400AUP multiplier. So, I decided to use a 435.15 MHz IF which pulls the 'drive' frequency down to a more efficient operating point of 40.605 GHz. This equates to 13.535 GHz from the brick.

Bench testing with my homebrew harmonic mixers on the spectrum analyser showed I had a 122.25015 GHz signal but it was quite weak.

I had also found the CTR960459102R01 X3 multiplier performed better delivering more RF at the higher end at 40.6 GHz than the CMA382400AUP multiplier. It also needs less RF drive than the CMA unit. Swapping the CTR unit in, I found a noticeable improvement in the 122 GHz signal strength.

In further testing on 122 GHz, I found that altering the DC bias (for RX optimisation) on the TX unit delivered a slight improvement in the RX signal strength on the other unit. I'm not entirely sure why this bias was necessary. Normally, it would seem to indicate that I am suffering from insufficient drive at 40.6 GHz. This still needs further investigation.

My initial observations on 122 GHz were the faster frequency drift due thermal changes affecting the TCXOs. IF signal 'wobbling' (quiver) on the audible tone was also much more noticeable on this third harmonic signal. I was able to reduce the frequency drift somewhat by fitting a 'heater' and more insulation around the TCXOs.

The signal 'wobbling' is an interesting phenomenon. On the test bench, once the TCXOs are up to 'internal' temperature and therefore relatively 'stable', the 'wobbling' of a GPS locked IF signal (435.15 MHz CW carrier) from the TX unit is quite noticeable on the third harmonic of 122 GHz. It gets even more noticeable when I tuned up to the fourth harmonic of 162 GHz. Not surprisingly, I could not find a signal at the fifth harmonic of 203 GHz.

The first ever VK 122 GHz QSO was conducted over a 1.5 kilometre suburban path. Signal reports were 5+1 both ways with some QSB.

So there you have it – a description of the techniques I used to develop **one** transverter that will cover **both** 78 GHz and the 122 GHz Bands.

In concluding this article - I hope the contents inspire a few of you to have a go with homebrew 78/122 GHz gear!

Cheers.

Acknowledgements

1 Kerry Banke N6IZW, San Diego Microwave Group for his technical article *A Simple Harmonic Mixer/Antenna Feed for 47 and 76 GHz Experiments.* For more information, check out this website: http://www.ham-radio.com/sbms/sd

2 Will Jensby W0EOM for supplying the 39/40 GHz multipliers.

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The vee beam antenna

Rob Norman VK5SW

If you are lucky enough to have the room, perhaps you may like to put up a multiband vee beam antenna for the HF bands. The dimensions of this antenna were provided by Nick VE3OWV. Each leg is 91.44 m (300 feet) in length. I used galvanised fencing wire with the ends spaced 51.82 m (170 feet) apart. This is an unterminated vee beam which can be used as a bi-directional antenna. If each end is connected to earth through a 600 ohm non inductive resistor the antenna is called a terminated Vee Beam and the front to back ratio approaches about three S points. Even so the gain is slightly less than the unterminated type. The layout of the antenna and a radiation pattern of an unterminated vee beam are shown in Figures 1 and 2.

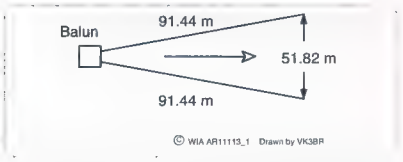

Figure 1: The layout of the vee beam.

For ease of construction, I sloped the antenna because of the height of the trees. The trees here are not very high so the antenna runs from about 8.5 metres to 1.5 metres in height. The direction in which the antenna runs must be carefully considered as it has a narrow beamwidth, especially on the higher bands. If the ends are not terminated but left open, the SWR is higher across the HF bands and an external tuner and tuned feeders may be needed to match it to the transmitter. The feedpoint impedance is about 600 ohms, so I used a 600 to 50 ohm balun (12 to 1) at the feedpoint and ran 50 ohm coax to the radio.

The tree in which the feedpoint is located is shown in Photo 1, and the 600 ohm (12 to 1) balun is shown in Photo 2. In my case the SWR on the 40 and 80 metre bands is very high and on the 30 metre band is about 4 to 1. On the 20, 17, 15, 12 and 10 metre bands the SWR of the antenna is about 2 to 1 or less and the inbuilt antenna tuner of my transceiver, an Icom IC-7600, is able to match it to the radio.

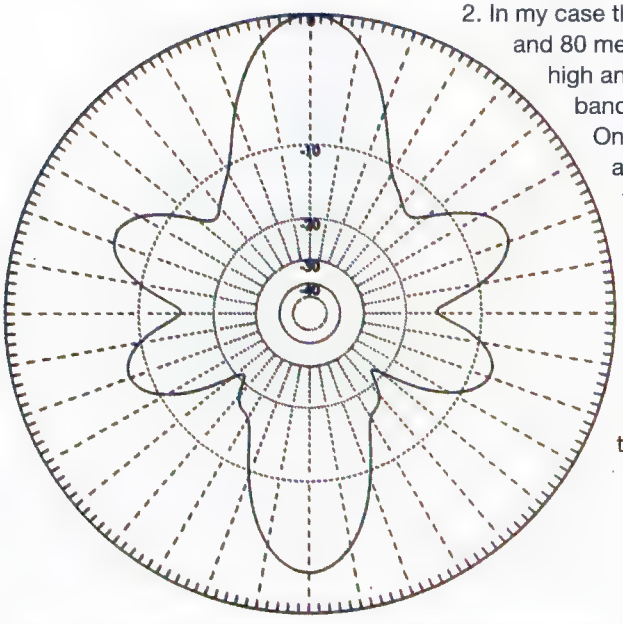

Figure 2: The radiation pattern of an unterminated vee beam.

Photo 1: The vee beam feedpoint, shown from a distance.

Photo 2: A close up of the vee beam feedpoint.

Photo 3: One of the antenna support poles.

Photo 4: The second of the antenna support poles.

Even though the SWR of the antenna on the lower bands is very high, the internal ATU of the IC-7600 is still able to match it to the radio so operation on all HF bands is possible here. This may not be the case with some other radios though. For instance, my other radio, a Yaesu FT-450 with an inbuilt ATU is not able to match the antenna on the three lower bands.

As the frequency of transmission is increased the effective length of the antenna is also increased giving better performance. Construction of the antenna is straight forward. Of course the higher in the air you can get the wire the better. If you have the room it would be well worth your while giving an antenna like this a go.

Photo 5: And – the other end of the antenna wire supported by a short pole.

Photo 6: One end of the antenna wire supported by a tree.

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70 cm hi/gain Yagi 3 m boom	$170
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Fatal foil

Steve Mahony VK5AIM

The Brown family of Mother, Father and two teenage boys decided to transform their garage into a rumpus room. A place where the boys and their friends could enjoy themselves and not mess up the house: The garage was ideal for this project. It was an extension of the house. With a brick wall on the house side, a brick wall on the outside, a brick wall at the back with a window and a door. A roller door faced the street. The roof was a continuation of the house roof to the guttering. It was agreed that the renovations would be a family job to all. The two boys were big enough to assist their father with the work. With a clean out of the car and garden junk all was ready.

The concrete floor was cleaned and given a coat of sealant. Next a wooden frame was tilted to take a ceiling. Insulation could be fitted later to help to keep the room cool. An electrical contractor friend agreed to fit another power circuit along with extra lights. The boys could do all the hard climbing work and he would do the final connections. With the electrical wiring in place, but not connected up, the foil insulation was stapled to the underside of the ceiling frames. There was much fun and carry on doing this. Holding the foil up with brooms while one of the boys stapled it in place. The whole family were involved. The next job was to fix the plaster board ceiling sheets in place. It was quite a job; it took them two whole weekends. Another weekend was required to paint the brick walls, a light colour, and the ceiling pale blue. Mum said the boys got more paint on themselves than the walls and ceiling. With the two power points connected up and two fluro lights installed the rumpus room looked good. Mother made some curtains with a boys theme on them for the back window. She even acquired some large curtains to cover the roller door on the inside to stop the heat being reradiated off the metal door. It could be pulled back and the door opened if required.

With an old fridge, some chairs and an old lounge along with a table tennis table it was a proper boy's room. Its completion was celebrated with a party with friends.

The room was constantly used. During the winter the boys and friends were hardly out of it. A portable gas powered heater made it quite cosy. It was getting close to Christmas and the boys and friends decided to dress the room up for Christmas. Festoon lights were bought along with fancy decorations. A small Christmas tree was purchased and set up in the corner.

It was decided to fit small toggle type eye bolts in each corner to support the decorations. With the aid of an aluminium step ladder and a battery drill holes were drilled in the ceiling and the toggle bolts installed. It was at the third toggle that things went wrong.

The hole was drilled by the oldest lad standing on the step ladder. He inserted the toggle bolt, pulled on it to expand the toggles, let out an unholy scream and fell off the ladder to the floor. All of the helpers rushed over to him. He had stopped breathing. One of the helpers immediately commenced mouth to mouth resuscitation and CPR but it was to no avail, he was dead. The helpers were shocked.

Dad immediately called the ambulance and police, who arrived in minutes. Meanwhile someone had opened the roller door for easy access. A medical examiner pronounced him dead. After every one had calmned down and made statements to the police Dad called his friend the electrician and asked if he could come over immediately. This he did. He found that the toggle bolt was alive with 240 volts mains.

At the coroners inquest it was found that the lad had been electrocuted. How and why the toggle bolt had become electrified was to be investigated. It happened in the following way.

When the power cable had been clipped along the side of the ceiling woodwork, as it neared the outside wall it had been allowed to run level with the lower edge of the wooden beam- not up about one to two cm from its lower edge as required. When the foil insulation had been clipped up with the staples, one staple, just one, had only gone into the wood with one leg, the other had missed the wood and gone up the side of the wood, penetrating the TNS electrical wiring. It had penetrated the active or live conductor plastic insulation but not made contact with the wire conductor at the time. By pure chance the cable had been laid with its active wire, the red wire, at the lower edge. If it had been the other way up the staple would have penetrated the neutral conductor, the black wire, and would not have been lethal. The staple leg had not made electrical contact at the time of insertion but with vibration and small building movements had made connection some time later, making that strip of foil insulation live. Contact across the foil strips must have been poor because the other toggle bolts, which had also gone through the foil insulation, would also have become live.

The coroner made the recommendation that all foil insulation should be fastened to the underside of the roof supports well away from any electrical wiring. Even placing the foil insulation on top of the ceiling beams could be hazardous as it is close to the electrical wiring. If contact could be made with conductors that have become bare or exposed, the foil would become lethal.

Why an amateur radio club station... in your school?

Peter Allen VK4HOY

An amateur radio club station is a vital vocational learning infrastructure that should be accessible by students at all schools throughout the world. Amateur radio has been a global learning and experimental platform for over 100 years, yet remains relevant in every sense in the 21st century. It is part of our world's leading edge, over the horizon space and spatial communications and information technologies that we use every day. The platform of global learning and experimentation is one of the key features that underlies our rapid advances in science research and technology application that has embodied humans as a highly connected species that has developed by the technologies of wireless communication - radio.

To imagine, dream, think and realise that hundreds of school students from around the world have directly spoken to astronauts by wireless communication – radio – on board the Earth orbiting International Space Station (ISS) on the station's own amateur radio station NA1SS is the reality of the 20th and 21st centuries. The largest engineering project in the history of the planet can be linked directly to individual students and their learning from all disciplines and interests.

At Caboolture Special School we took the challenge and established our very own amateur radio club station – VK4HBU. Our club is an affiliate of the Wireless Institute of Australia and is strongly supported by the many members of the Redcliffe and District Radio Club, the Caboolture Amateur Radio Club and the Sunshine Coast Amateur Radio Club. The students at our school have had access to not only school owned equipment but the opportunity to use this equipment to learn and develop safety skills, technical skills and vocational skills including skills in literacy, numeracy and communication. Team and social skills learning brings the group together and creates wellbeing and a strong sense of community for our students and our staff.

Mark Pedersen VK4FMJP, a Teacher's Aide at Caboolture Special School, ready to operate the Club station using a handheld transceiver.

If your school setting builds and accesses the infrastructure of an amateur radio club station then you are providing the single best global learning and experimental platform that is affordable and sustainable under the most extreme and varied conditions. Amateur radio utilises the internet's capacity as its own, but is not tied to its cost, speed or reliability. The amateur radio station can stand alone and be vital in times of natural or human evoked disasters.

The individual and community capacity combined in an amateur radio station provides an engaging, enthralling, interesting, mystifying and challenging vocational and technical learning opportunity that every educational institution should own and cherish, for the benefit of their students. So take to the task and build your school's amateur radio club station. We did and it's great!

Peter Allen VK4HOY is the Vocational Technical Education Co-ordinator at the Caboolture Special School's amateur radio club station, VK4HBU.

An ESR meter for electrolytic capacitors

Jim Tregellas VK5JST

I recently had to repair the favourite radio of VK5YL (my wife), which is an Icom IC-751A, and after much fooling about, finally discovered the problem. This was a shorted 100 µF electrolytic in the main supply line of the VCOs. Point was that my fancy digital ESR checker did not find this faulty electrolytic, simply indicating it as OK with a very low ESR. Shorted electros are not that uncommon, and the meter described in this article will find them, and so if you have a dead transceiver, internet modem, computer motherboard, or anything else which uses electrolytic capacitors, then this is the meter to build. It is an accurate and cheap instrument that handles the complete range of electrolytic capacitors normally found in consumer equipment, which is from 1 µF upwards.

What is ESR?

ESR is short for 'equivalent series resistance'. As the label implies, it is a resistance placed into the electrical 'equivalent circuit' of a practical capacitor to represent its losses. The ESR principally represents losses which occur in the dielectric material and in the resistance of the leads and plates.

ESR and electrolytic capacitors

Talk to anyone in the service area of electronics and you will discover that aside from idiot consumers, the majority of problems in modern equipment are caused by faulty electrolytic capacitors. There are a number of reasons for this, with cost pressures and miniaturisation being major factors. Both of these limit the amount of aluminium which is, or can be put into the can, which in turn seriously limits life because electrolytic capacitors rely for their operation on what is essentially an electroplating action where one plate ultimately vanishes. The second driving factor is the increasing use of switch mode circuitry in consumer equipment to reduce weight and increase efficiency, in which ever higher ripple currents are used. These currents in combination with the series loss resistance of the capacitor generate heat, raising the internal temperature of the capacitor above that of the ambient. As any chemist will tell you, there is a basic law in chemistry which says that the rate of a chemical reaction about doubles for each 10 degree Celsius rise in temperature, and so it is not surprising that these miniature capacitors, pushed ever harder in already hot environments, fail quickly. Put another way, this means that the life of an electrolytic capacitor will about roughly halve for each 10 C temperature rise, all other things being equal. In fact the design life for common electrolytics in domestic use is around 2000 hours at their maximum allowed operating temperature (either 105 or 80 degrees C). As there are just 8760 hours in a year, this is a three month life at maximum ratings! Moral - keep electronic equipment cool and underrate the components. As a last comment, this same law applies to semiconductors and should be not be forgotten by those who think overclocking their computer motherboard is clever.

Photo 1: The completed ESR meter.

Anyway, the results of all these engineering design pressures are easy to see. Have a look at any modern piece of electronics and there are often obvious visual clues of faulty capacitors. Computer motherboards with their very high on board power supply ripple currents are a case in point, and anything over 12 months old in 12 hour/day usage is likely to exhibit one of the following increasingly serious symptoms:

(a) top of the can bulging,

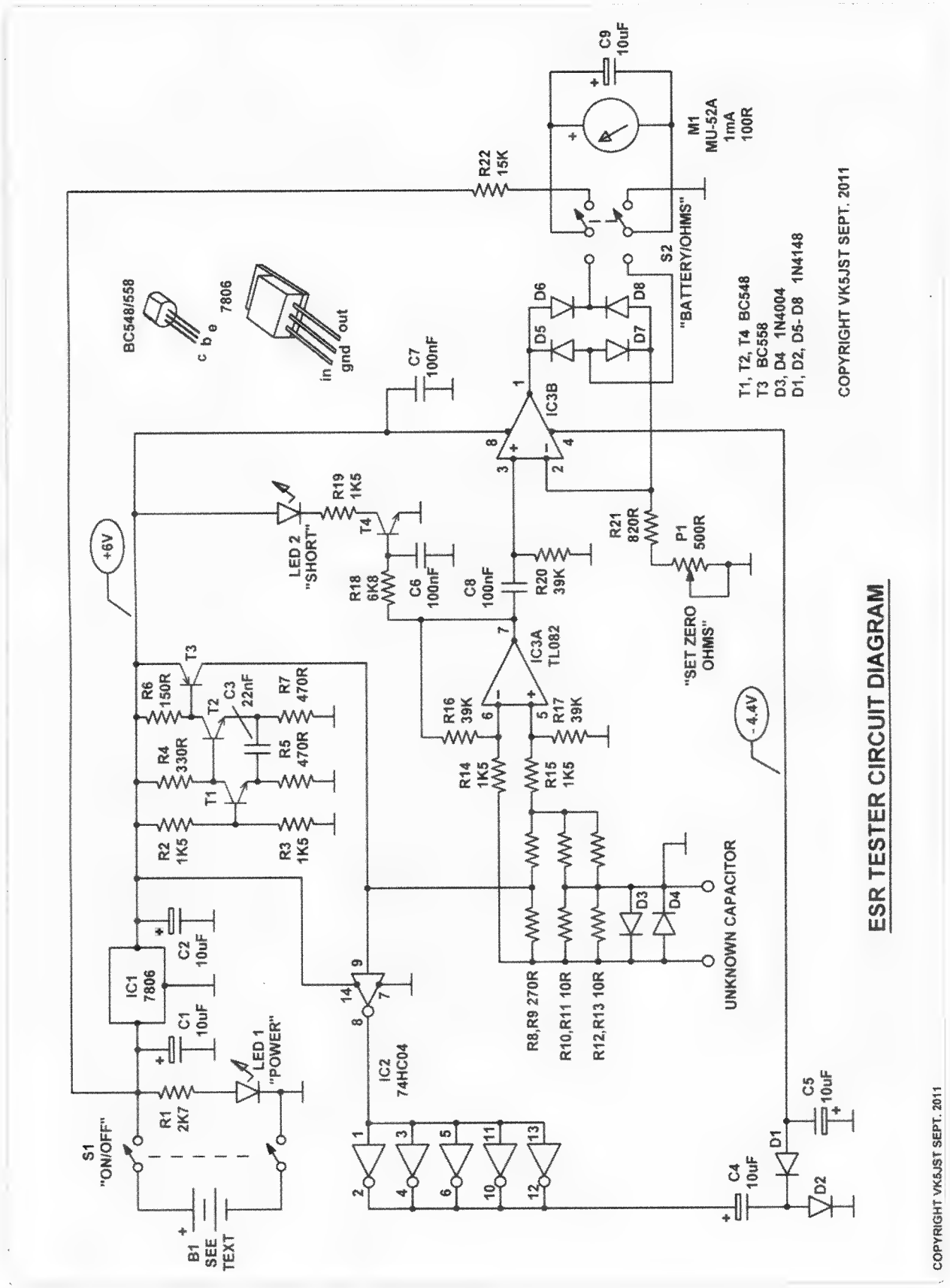

Figure 1: ESR tester circuit diagram.

(b) top of the can bulging and the centre of the explosion safety punching cracked open with leaking electrolyte emerging, or
(c) explosion safety punching completely open.

These are obvious visual indications of thermal runaway. The high ripple current used raises the temperature significantly, which in turn causes the capacitor to rapidly reach end of life where the ESR rises, causing ever greater internal temperature rises, and so on. Finally the enormous gas pressures generated inside the can open the explosion safety punching in the can top. The electrolyte vanishes, the capacitor goes 'dry', the capacitance falls, and the ESR rockets upwards. Ripple voltages increase dramatically, and semiconductors hanging off the supply line may fail through over-voltage.

These visual clues disappear if the capacitors are used fairly conservatively, but the ESR still ultimately goes through the roof at end of life, and this is where ESR meters are really useful.

To summarise, all this means that anyone servicing a piece of gear is not looking for changes in ESR of a few per cent, but for big changes of at least several hundred per cent. This should be kept clearly in mind when searching for faults.

Typical ESRs

And now we enter a jungle, because manufacturers are singularly reticent about publishing this most important piece of data. Probably the best advice is to use relative comparisons on any piece of electronics. Tucked away somewhere on the printed circuit board will usually be at least one electrolytic which is seriously underrated and which has survived in near new state, and thus can be used as a standard against which all the other capacitors on the board made by the same manufacturer can be checked. Another rule of thumb used by the service industry is that any physically small low value electrolytic in the range 1 to 10 µF with an ESR under three ohms is probably OK . But you still need somewhere to start and the table included in the front panel drawing of the meter gives typical values. Bear in mind that the quality of capacitor in a particular case size can vary by several hundred per cent from manufacturer to manufacturer, so this table is not written in stone. A good guide to the quality of a capacitor in a particular case size is its weight. Heavy capacitors generally have a long life because there is a lot of aluminium inside. The ESR is also generally lower than normal because they are made for high ripple currents and there is excellent mechanical contact from the outside world to the large plates. You get what you pay for...

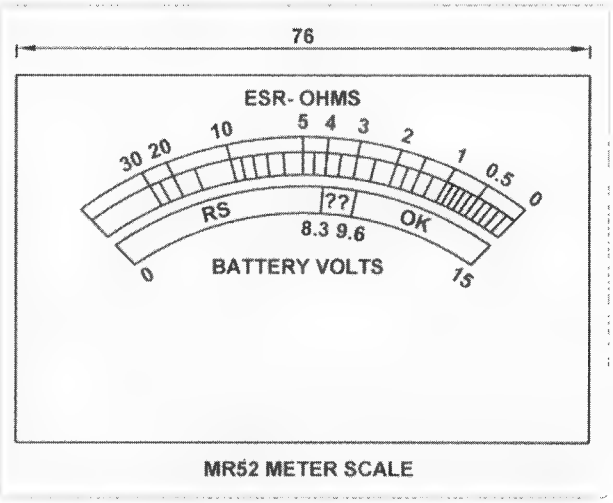

Figure 2: ESR meter scale graphics to suit MR52 meter.

This table is the result of many measurements on hundreds of miniature domestic grade electrolytics in my junk box. It is for modern capacitors with working voltages between 6.3 and 63 volts and capacitances of 1 µF upwards. Use it as a guide until you develop a feel for what is right in a particular piece of equipment. It is also worth noting that ESR generally rises as working voltage increases. For 400 and 500 volt capacitors these figures can probably be multiplied by two.

How it works

The principle behind most ESR meters is that the test frequency applied to the test circuit should be so high that the capacitor under test does not have time to charge significantly during a half cycle of the test waveform.

Another way of putting this is that the reactance of the capacitor under test should closely approach zero, so that the only ac voltage which appears across it is due to the current which flows through its series loss resistance. This voltage is then used to drive a meter calibrated in ohms of ESR. In this circuit, the test frequency used is 100 kHz, which is unusually high and allows accurate testing of capacitors as small as 1 µF.

So circuit operation starts from a 100 kHz clock oscillator (T1 and T2) which drives T3, a saturated mode switch, to produce a square wave swinging from 0 to 6 volts at T3 collector. This square wave drives a power supply circuit to create a -4.4 volt supply for IC3. The supply consists of a 74HC04 hex inverter, D1 and D2, and C4 and C5. The 74HC04 provides a 0-6 volt voltage swing and large current sink and source capabilities to drive the rectifier system.

T3 also drives a Wheatstone bridge with 270 Ω upper arms and 5 Ω lower arms. Because a regulated 0- 6 volt drive is applied to the top of the bridge, a square wave swinging from 0- 110 millivolts exists across each 5 Ω resistor in the bridge when nothing is connected to the test terminals. This very small test voltage means that (a) the

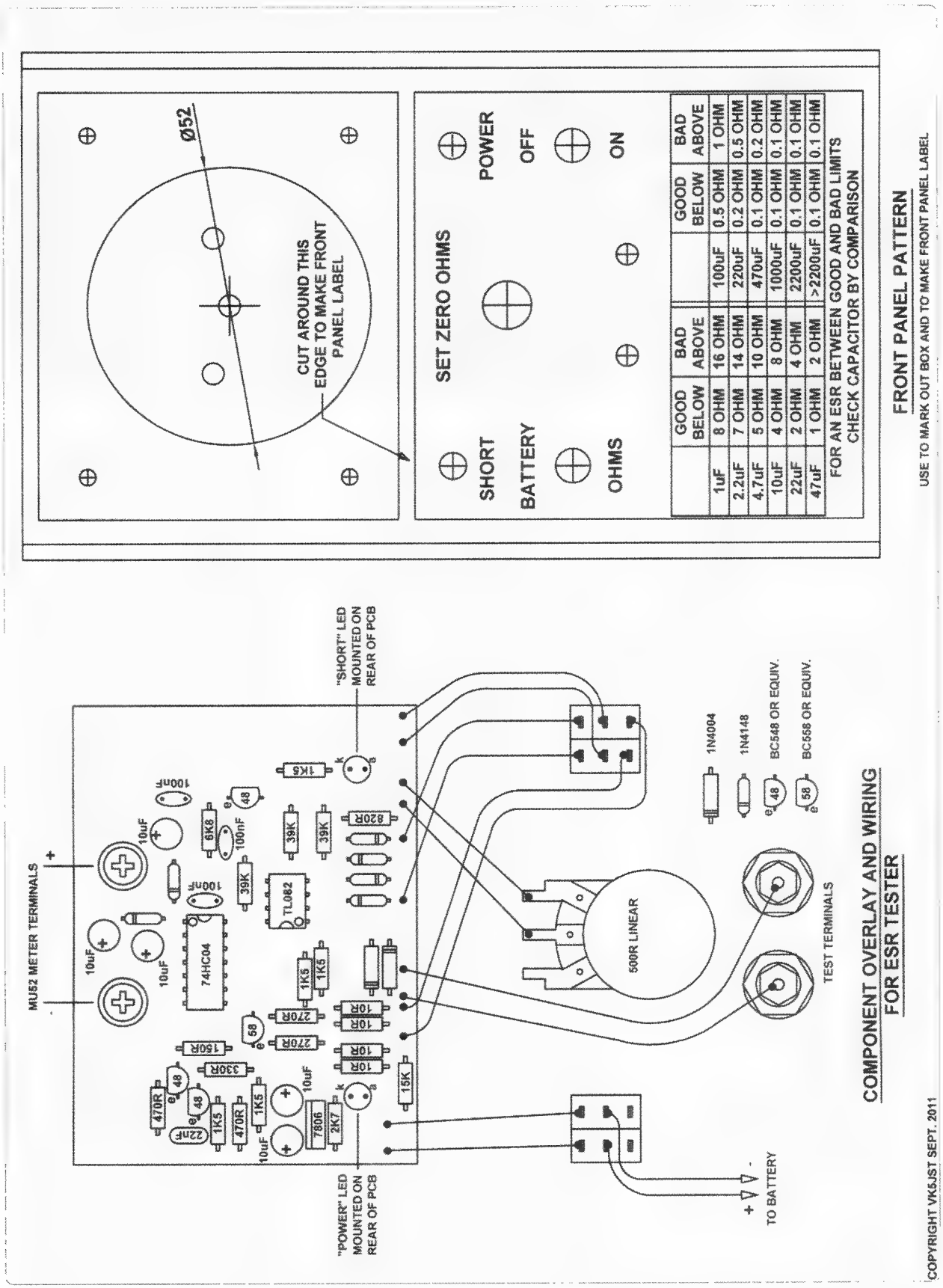
Ø52
CUT AROUND THIS EDGE TO MAKE FRONT PANEL LABEL
SET ZERO OHMS
POWER
SHORT
OFF
BATTERY
ON
OHMS
FRONT PANEL PATTERN
USE TO MARK OUT BOX AND TO MAKE FRONT PANEL LABEL
GOOD BELOW | BAD ABOVE | | GOOD BELOW | BAD ABOVE
1uF | 8 OHM | 16 OHM | 100uF | 0.5 OHM | 1 OHM
2.2uF | 7 OHM | 14 OHM | 220uF | 0.2 OHM | 0.5 OHM
4.7uF | 5 OHM | 10 OHM | 470uF | 0.1 OHM | 0.2 OHM
10uF | 4 OHM | 8 OHM | 1000uF | 0.1 OHM | 0.1 OHM
22uF | 2 OHM | 4 OHM | 2200uF | 0.1 OHM | 0.1 OHM
47uF | 1 OHM | 2 OHM | >2200uF | 0.1 OHM | 0.1 OHM
FOR AN ESR BETWEEN GOOD AND BAD LIMITS CHECK CAPACITOR BY COMPARISON
"SHORT" LED MOUNTED ON REAR OF PCB
MU52 METER TERMINALS
74HC04
TL082
7806
500R LINEAR
1N4004
1N4148
BC548 OR EQUIV.
BC558 OR EQUIV.
TEST TERMINALS
TO BATTERY
"POWER" LED MOUNTED ON REAR OF PCB
COMPONENT OVERLAY AND WIRING FOR ESR TESTER
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Figure 3: Front panel artwork for the ESR meter (above) and the Component overlay and wiring diagram (below).

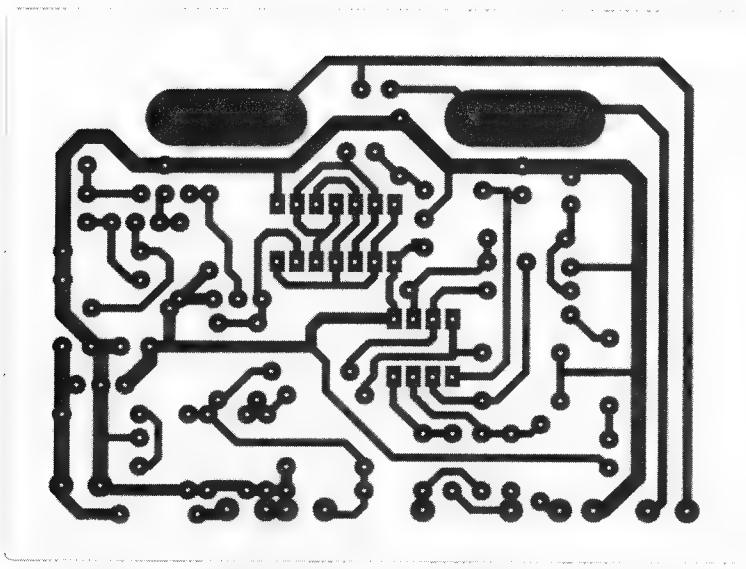

Figure 4: Printed circuit board artwork for the ESR meter.

polarity of the electrolytic does not matter when it is connected to the instrument and (b) the ESR meter can be used for accurate in circuit testing of capacitors because no semiconductor junctions will be turned on.

So with nothing connected to the test terminals, the bridge will be in balance and the 110 mV voltage swings applied to the inverting and non-inverting op amp input terminals (IC3A) via R14 and R15 will be the same. When these input voltages are added together by this differential amplifier, they cancel out with the result that the amplifier output sits at zero volts. As there is no ac input to the precision rectifier circuit (IC3B) via the ac coupling circuit C8 and R20, the meter will read zero (infinite resistance). As there is no dc applied to the base of T4 via the integrating circuit R18 and C6, LED 2 remains off.

If we now connect a perfect capacitor to the test terminals (zero reactance, and zero ESR), there will be a perfect ac short circuit across R10 and R12. The current which flows through these resistors normally produces a 0-110 mV swing across them, and so the capacitor will charge to the average value of these two levels which is 55 mV dc. The other side of the bridge will continue to supply 0-110 millivolts to the amplifier. So we have 0-110 millivolts ac (average dc level 55 mV) applied to the non-inverting terminal of the amplifier, and 55 millivolts dc applied to the inverting terminal. The bridge is thus in dc balance, but out of balance for ac. As IC3A has a gain of 26, the result of this is a swing of 2.8 volts peak to peak at the output of IC3A, swinging symmetrically around zero volts. This ac voltage is passed to the precision rectifier to deflect the meter to full scale (zero ohms) but note that if we integrate this swinging voltage over time with R18 and C6 (a low pass filter) the result is an average voltage of zero volts, so T4 and LED 2 stay off.

With a practical capacitor which has loss, a small ac voltage will develop across its ESR and this ac voltage will be subtracted from the 110 mV swing at the other bridge output terminal, leading to a reading on the meter of less than full scale deflection.

Now if the capacitor being tested is a short circuit, one arm of the bridge will be completely shorted to ground and the bridge is thus unbalanced in both an ac and dc sense. The only input to IC3A is a 0-110 millivolt swing (55mV average) from the right hand side of the bridge, and when this is amplified, the result will be a swing at the output of IC3A of 0-2.8 volts dc. This is the same ac swing which occurs with the perfect capacitor but this time with a dc offset. So the meter still shows full scale (zero ohms) due to the ac component, but this time the dc offset (1.4 volts average) turns on T4 and LED 2 indicating a short circuit.

And that is it. In summary, unless the capacitor is shorted, only the ESR is displayed. With a short circuited capacitor or a low value resistor connected to the test terminals, the 'short' led turns on, and in the case of a resistor, the resistance is displayed.

Building the unit

Start with the case. Mark out where to drill on the BACK of the UB1 box (used as the front panel) by accurately pricking through a photocopy of the front panel drawing at the hole centres. Now drill small pilot holes, say 1.5 mm, and then open out all holes to suit your potentiometer, LEDS and switches. Drill slowly and gently and clamp firmly, as the plastic used in these boxes is famous for 'grabbing' and tearing the box out of whatever is holding it. Grinding the leading edges of your drill so that they have zero rake angle makes drilling these sorts of plastics safe.

Prepare and apply your front panel label which is cut out of another photocopy of the front panel drawing. (Use 150-200 gsm paper for this copying.). Cut around the label edges, and laminate it for long life. With the point of a very sharp knife exactly cut out the two 5 mm holes for the LEDS. Use these holes and a couple of 5 mm LEDS placed into the case holes to guide the label into position when you stick it to the case with double sided adhesive tape. Once the label is stuck down, use the sharp point of your hobby knife to cut the remaining holes in the label using the case holes as a guide.

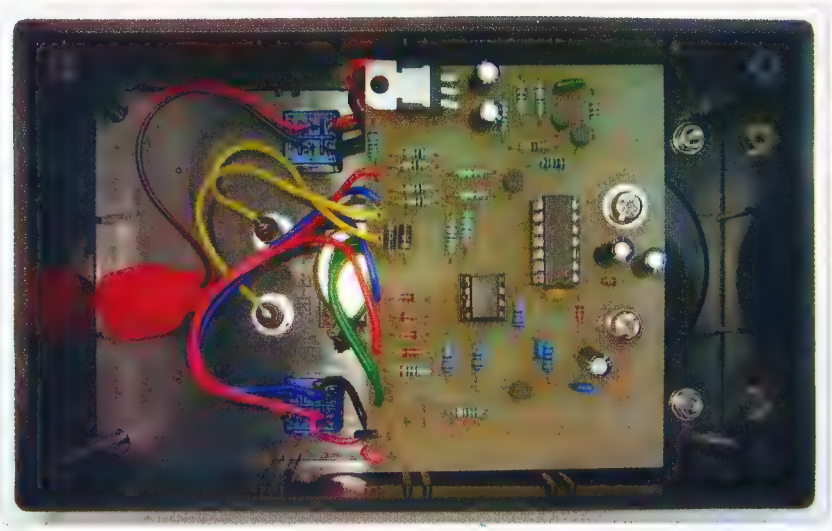

Photo 2: A view of the inside of the completed ESR meter prior to adding the batteries.

In a very clean environment, disassemble the meter. Remove the aluminium scale. Photocopy the meter pattern, cut around its borders, and stick it to the back of the scale with double sided tape. The double sided tape should be applied to the back of the scale and totally cover it. Align the top of the meter pattern exactly with the top of the aluminium scale. Trim up with a sharp knife and reassemble the meter. Now mount the meter, switches, potentiometer and terminals to complete all case work.

Make and drill the printed circuit board. The printed circuit pattern shown is an industry standard TOP view and generates a board with outside dimensions of 63.5 x 86.4 mm (2.5 x 3.4 inches). Assemble all components to the PCB using sockets for the ICs. Double check the polarity of all diodes and electrolytics. Solder 125 mm lengths of colour coded wire into the wiring holes along the board edge. Screw the PCB to the meter terminals and complete all wiring. Your tester is now finished.

Other meters

Other meters can be used and will make the instrument very cheap to put together if you have one lying about. Here are the modifications. For a 50 µA movement change R21 to 15K, P1 to 10K and R22 to 300K (150+150K). For a 100 µA movement these values are respectively 8K2, 5K, and 150K, while for 200 µA they are 3K9,2K and 75K (2@150K in parallel). For a 500 µA meter, use 1K5, 1K and 30K. (15+15K). Note that the printed circuit board has extended contact pads so that holes can be drilled to match your meter.

If you need to draw a new scale for the meter you select, the calibration line for a particular resistance R ohms occurs at an angle given by 45 + ((990R)/(11R+54)) degrees (Cartesian coordinates). Zero ohms occurs at 45 degrees and infinity at 135 degrees. This data is useful in a package such as AutoCad.

Batteries

A worst case 7806 regulator needs at least 8.3 volts of input to operate correctly. Possible power sources include plug packs with an output voltage in the range 9-15 volts, 6 @ AA or AAA zinc carbon 'cheapies' which will give 6 x 1.8 volts=10.8 volts when new and nine volts near end of life, and 8 @ 1.2 volt rechargeables which will give 8 x 1.5 volts=12 volts shortly after a recharge, and 9.6 volts under normal conditions. Take your pick. Normal instrument current drain is 50 mA, which means you get eight hours life out of cheap AA 400 mAh zinc carbon cells, and a lot more out of high capacity rechargeables.

ESR Meter - Parts list

Resistors (all 0.25 W 5%)
4 @ 10R
1 @ 150R
2 @ 270R
1 @ 330R
2 @ 470R
1 @ 820R
5 @ 1K5
1 @ 2K7
1 @ 6K8
1 @ 15K
3 @ 39K

Pots
1 @ 500R linear 24 mm diameter with knob

Capacitors
5 @ 10 µF 16 VW PCB mtg Al. electros.
3 @ 100 nF (0.1 µF) 50 VW monolithic.
1 @ 22 nF (0.022 µF) 100 VW Greencap

Semiconductors
3 @ BC548 or equivalent
1 @ BC558 or equivalent
6 @ 1N4148 or equivalent
2 @ 1N4004 or equivalent
1 @ 7806 regulator
1 @ 74HC04
1 @ TL082 (or TL072)
2 @ 5 mm diameter 2000 mcD red LEDs

Switches
2 @ C&K 7201 DPDT or equiv.

Hardware
8 @ AA battery holder
1 @ MU52A 1 mA 100 ohm meter
1 @ meter scale
1 @ UB1 box
2 @ 4 mm test terminals
1 @ front panel label
1 @ printed circuit board

Finally

Good building. Save yourself dollars and save the environment by repairing/recycling with this instrument. Our 'cheap' throwaway electronics is eventually going to cost us and our children a real bundle.

Build your own ESR meter?

ESR Meter parts – complete parts kit, $69.95 plus postage.
Order on-line from Aztronics Pty Ltd, 170 Sturt Street, Adelaide, SA. 5000. Phone 08 8212 6212 or at *www.aztronics.com.au*
PCB only, $10.00 plus postage.
Order on line from VK5JST, *www.users.on.net/~endsodds*

The RF Porta-Test – a portable tester for the radio experimenter

Peter Parker VK3YE

Photo 1: The completed Porta-Test.

The pocket multimeter is the most used piece of test equipment for people in electronics. It's small, cheap and measures many things, sometimes including frequency. Unfortunately they miss other common RF tests such as output power, field strength and transmission monitoring.

Different test equipment does different things, but inside there are similar shared stages, such as oscillators, amplifiers, detectors and meter movements. Build several in the one box and you have a multi-purpose instrument with some creative switching. And because the dearest parts are switches, cases and meter movements, you get an instrument with eight or more functions for little more than the cost of one alone.

Designing this 'Swiss army knife' of RF instruments is sure to involve compromise, especially with a hand-held unit like this. However nothing like it is commercially available for the price and the numerous functions provide unbeatable convenience.

Construction is a snap for those who've made a few projects. Only common parts are used and substitutions are easy. Beginners daunted by the switching should build function by function, connecting the switches in later.

Functions and circuit description

The RF Porta-Test has the following functions:

- RF power meter. RF is applied across a 50 ohm dummy load formed by parallel resistors. The AC voltage produced is rectified and fed to the meter movement via a dropping resistor. This resistor is set for 100% meter deflection at the desired maximum power range.
- Amplified field strength meter. RF power is sensed by the telescopic whip and rectified in a two-diode voltage doubler circuit. The resultant DC is amplified by an LM386 before being fed to the meter. This unit is broad band, responding to signals of all frequencies.
- Amplified absorption wavemeter. Works much like the field strength meter but has a tuned circuit, adjustable over 0.7 – 1.9 and 3.4 – 17 MHz so that it only responds to signals of a set frequency.
- Audio signal tracer. Again, it uses the LM386 but as an audio amplifier circuit. It is also handy as an accessory amplifier for projects.
- AM transmission monitor. Connecting the absorption wavemeter to the audio signal tracer forms a receiver suitable for testing AM transmitters on 160, 80, 40, 30 and 20 metres. It also picks up local AM broadcast stations and 160 metre AM operators within about 5 – 10 km.
- SSB/CW transmission monitor. This is similar to the AM transmission monitor but with a local oscillator to test amateur transmitters operating on 3.58, 7.16, 14.32 or 28.64 MHz.
- WWV receiver. When connected to a full-sized antenna the SSB/CW transmission monitor is sensitive enough to receive WWV on 5 MHz at night. Amateurs on 3.580 MHz can also be heard.
- Fixed frequency RF signal generator/band marker. Switchable 3.58 and 5 MHz crystal oscillator with harmonics allows testing of receivers on 3.58, 5, 7.16, 10, 10.74, 14.32, 15, 17.9, 20, 21.48, 25 or 28.64 MHz.

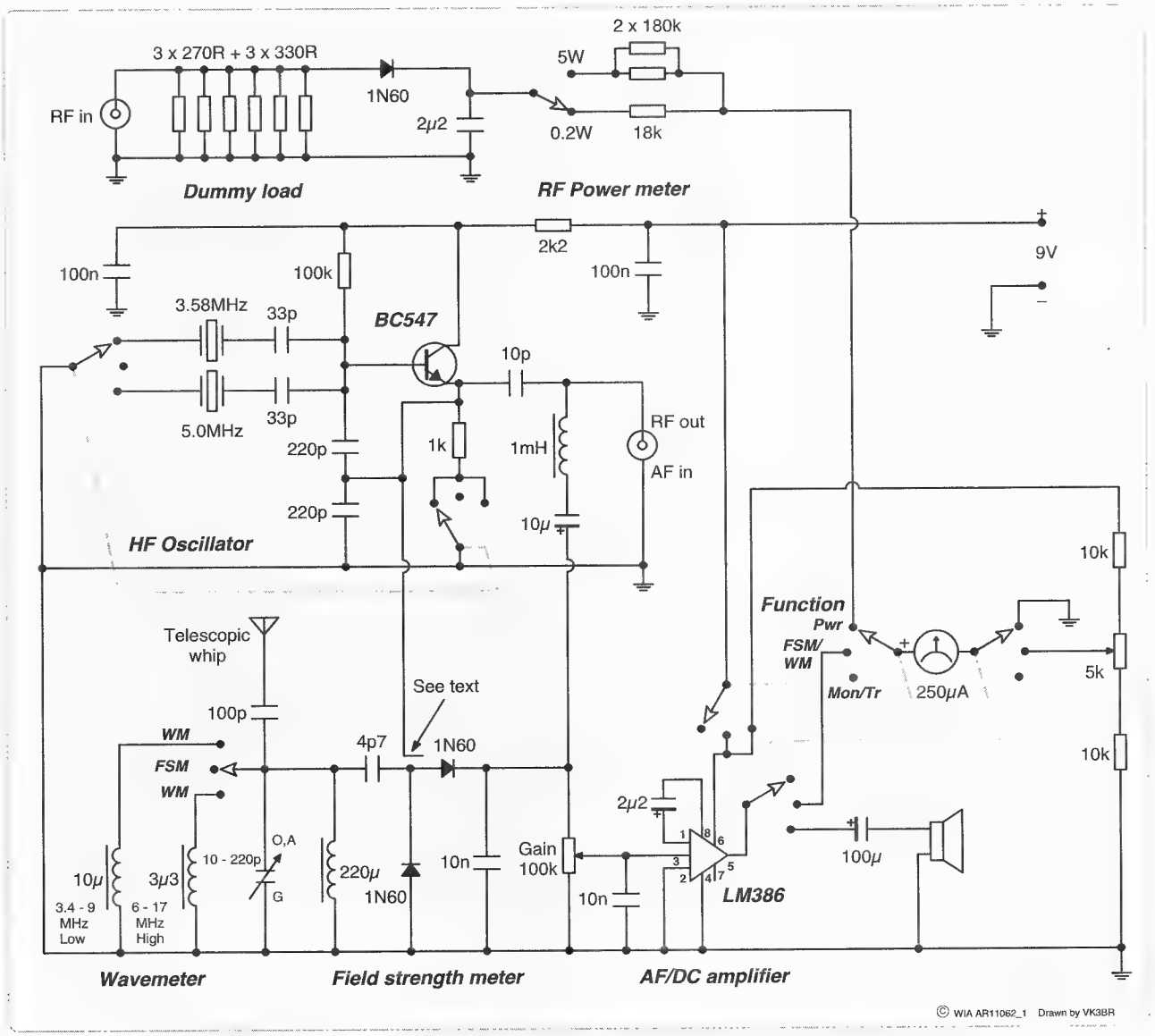

Figure 1: The Porta-Test circuit diagram.

Only a handful of parts are needed to perform all these functions. The most important are (i) an analogue meter movement, (ii) LM386 audio or DC amplifier, (iii) tuning capacitor and coils for the wavemeter, (iv) NPN transistor for the crystal oscillator and (v) resistors for the dummy load. In addition rotary and toggle switches allow these stages to be switched in or out as required.

Obtaining components

Only fairly common parts are used. Salvaging switches, the speaker, meter movement, telescopic aerial, knobs and case can halve the cost. Germanium signal diodes are common in discarded radios and are identifiable by their clear glass cases with two bands near one end. Any type is suitable for this circuit.

Though they look like rotary switches in the circuit diagram, the switches in the HF oscillator and field strength meter/wavemeter stages are actually toggle switches with a centre off position. The 'neutral' position reduces wiring and saves panel space. A pair of standard double throw switches can be substituted for each switch if desired.

Any enclosure with a panel large enough for the speaker, meter movement, switches and sockets will suffice. Don't go too thin, otherwise there won't be clearance for the telescopic whip, battery and circuitry. If in doubt use a bigger box to allow room for a proper tuning dial, larger meter or switches for more functions.

My meter movement is 250 µA but other values can be used with different series resistors for the power meter function. The series resistor values are calculated by determining the peak RF voltage needed for each range and using a value that provides full-scale deflection. More detail is provided in the panel.

Construction

The larger components are screwed or glued to the front panel. Some smaller parts are mounted point to point behind the front panel. This looks messy but provides for short leads – important for RF equipment. The LM386 stage, which operates at DC and audio frequencies only, is on its own small board mounted behind the speaker. Unclad perforated board is used here.

A good plan is to build and test one or two stages at a time as successful completion provides motivation to carry on. The RF power meter uses the fewest parts and can be built first. The RF-carrying parts, that is, the six dummy load resistors, diode and capacitor, should be mounted on the rear of the antenna socket to minimise lead length. You may wish to test this before wiring up the switch – temporarily connect the meter negative terminal to earth and the positive terminal to the power meter's two resistors.

Applying RF should make the meter move. Calibrate by applying various DC voltage across the dummy load, calculating what power each voltage represents, and noting the scale reading. Tape a calibration chart to the case if desired.

The field strength meter's front-end can be tackled next. Leave out both RF chokes, the variable capacitor and all circuitry to the right of the gain control. Temporarily connect the meter's positive terminal to the wiper of the gain control and set to maximum. Applying a few watts of RF near the meter should cause a deflection.

The RF choke in the field strength meter is not critical and you could use 1 mH if you have one at hand. However 220 μH is preferred as it provides an extra wavemeter band, 0.7 – 1.9 MHz. This is useful for checking field strength and AM modulation quality on 160 metres. Local AM broadcast signals can also be heard if connected to an external antenna.

Construct the wavemeter portion by adding the variable capacitor. Set the trimmers on the back to minimum and bridge the oscillator and aerial tabs to place both sections in parallel and maximise capacitance. Add the switch and inductors, which are actually RF chokes available for about $2 each.

With 7 MHz of RF applied near the antenna adjust the variable capacitor for peak meter reading. This should appear somewhere near the clockwise end on the low frequency range with the 10 μH coil switched in and the anti-clockwise end for the high frequency range, with the 3.3 μH coil switched in. Repeat for 3.5 MHz, the low range and 14 MHz, the high range.

Several compromises were made to simplify switching between the wavemeter and field strength meter. For example the tuning capacitor is permanently wired across the 220 μH RF choke used for the field strength meter. This should be set clockwise (minimum capacitance) to minimise its effect. However even when this is done meter sensitivity will be low at upper HF and VHF frequencies. Add an extra toggle switch to isolate the unwanted wavemeter components if this is a problem.

Once happy with the non-powered parts of the meter, start building the LM386 stage. While this chip is most familiar in its use as an audio amplifier, its main use here is as a DC amplifier for the field strength and wavemeter functions. The LM386 and related parts are mounted on unclad perforated circuit board about 3 x 4 centimetres.

Connect this stage to the field strength meter/wavemeter circuitry and the meter movement - for testing there is no need to wire in the rotary switch yet but your connections should be based on it being in centre position. Connect a nine volt battery and watch the meter needle. If the circuit is operating correctly you will see it move when you adjust the 5 k trimmer potentiometer. Set this potentiometer so that the meter is reading zero.

Repeat the field strength and wavemeter tests, with the gain potentiometer set to maximum initially. If all is well there will be an indication on the meter when RF is applied, with greater sensitivity now with the amplifier connected. Connecting the speaker, via its coupling capacitor, instead of the meter should allow 'duck talk' to be heard if testing on SSB. Also note the click or faint hum if you insert some wire into the AF input socket – this proves the signal tracer is working.

The final active part of the circuit is the switchable crystal oscillator. Its main use is for the SSB/CW transmitter monitor since it provides the beat frequency oscillator for what is effectively a direct conversion receiver. It also provides a useful signal source for testing receivers and calibrating the wavemeter. The switch, again a centre off unit, switches between 3.58 MHz, no signal, and 5 MHz.

Varying the capacitors in series with each crystal allow a slight frequency shift. The lower the value, the higher the frequency. Aligning to an exact frequency is useful for it to be a crude frequency standard or to allow effective reception of the WWV time signal on 5 MHz. Similarly the 3.579 MHz crystal could be tweaked to 3.580 MHz as this is a popular frequency at night. Values between about 22 and 100 pF are suggested, with a trimmer suggested for more precise adjustment.

The output from the crystal oscillator is fed to the wavemeter's diode detector. There is no direct electrical connection – instead it is coupled loosely through a few turns of insulated enamelled copper wire wrapped around the junction of the diodes. Optimise this later with a low-level SSB signal on 3.58 MHz.

A few millivolts of RF available from the same socket used for the signal tracer's audio input

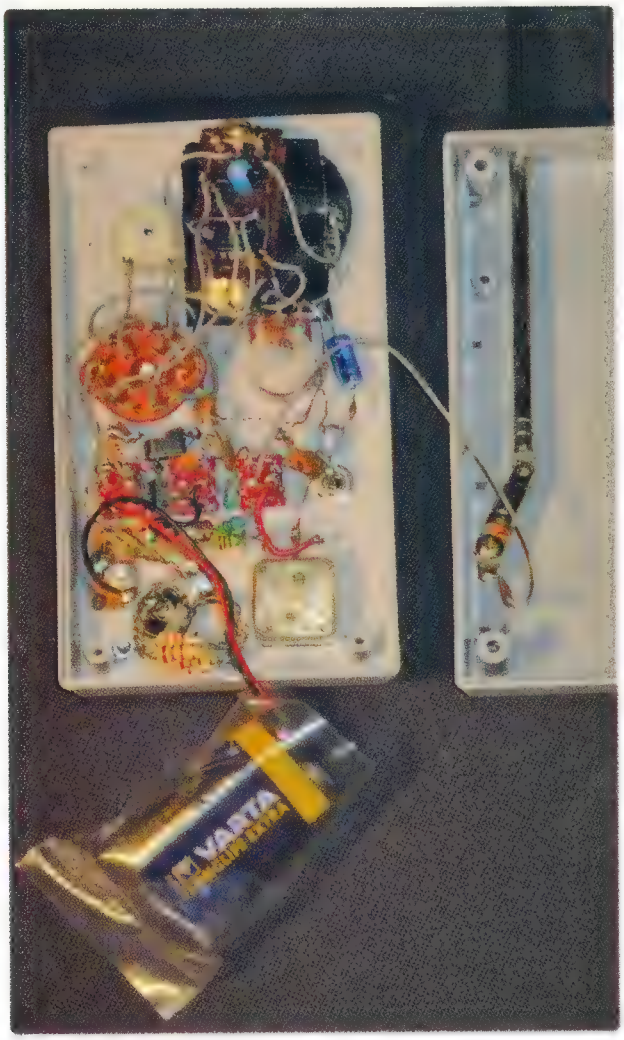

Photo 2: The Porta-Test, showing the internal construction arrangements.

is available to test or calibrate a receiver. An RF choke here blocks stray RF from entering the LM386 amplifier stage. HF outputs include 3.58, 5, 7.16, 10, 10.74, 14.32, 15, 17.9, 20, 21.48, 25, 25.06, 28.64 and 30 MHz. An unplanned benefit is that the RF oscillator helps calibrate the wavemeter as the meter needle swings when the wavemeter is adjusted near an oscillator frequency or harmonic. This helps identify the main amateur bands covered without need for a dial scale.

The wiring around the three position four pole rotary switch is the hardest part of the project. If done wrongly no function will work and there may be odd readings or sounds. Initially wire the power meter only section of the switch, using the contacts that connect when the switch is in its clockwise-most position, and check this still works. Repeat for the field strength/ wavemeter and monitor sections.

Ensure that the battery and LM386 circuit board are anchored out of harm's way and close the case. A small plastic bag over the battery can prevent shorting.

Use

The Porta-Test has many switches and controls for a small instrument. It takes a bit of getting used to as several interact for various functions. A separate on-off switch is not needed. Instead when not in use switch to the RF power meter function and set the crystal oscillator switch to centre (off) position.

The RF power meter is the easiest – there are no controls apart from the rotary function switch.

For the field strength meter set the function switch to middle position, the FSM/WM switch to middle or neutral position and the tuning capacitor to minimum capacitance (clockwise). Switching the function switch to the monitor mode allows what's picked up to be heard on the speaker rather than displayed on the meter. The crystal oscillator should be off for this test. Stronger AM broadcast stations may be heard if an external antenna is connected and the tuning capacitor adjusted.

The wavemeter is similar to the field strength meter except one of the coils is selected and the variable capacitor adjusted for a peak reading. Again the monitor function allows reception of the AM signal. You can monitor SSB or CW signals on 3.580 MHz or harmonics by switching the oscillator to 3.58 MHz so it beats with the incoming signal. Connect a large outside antenna and you may be able to hear WWV through the monitor at night when the frequency is switched to 5 MHz and the wavemeter peaked accordingly.

The internal oscillator has other uses as well. It can be used to calibrate the wavemeter on 3.58 MHz, 5 MHz and harmonics. With both the wavemeter and oscillator on, look for meter deflection when tuning the wavemeter.

For the fixed frequency RF signal generator switch the function to RF power output to remove power from the un-needed LM386 stage. Selecting either 3.58 or 5 MHz activates the oscillator. For calibrating and testing receivers a small amount of oscillator output is available from the RF out/AF in socket.

Finally the AF signal tracer can be used with the function switch in monitor and all other functions off. But attach an external antenna and local AM broadcast stations will be audible if adjusting the tuning in field strength meter mode.

Conclusion

It's hard to know when to stop when developing projects like this. A dropping resistor and two sockets will provide a DC voltmeter function while a diode probe allows RF voltage measurements. Switching in the battery would permit resistance and continuity tests. Check crystals by adding a crystal socket on the front panel. More wavemeter coils broaden its range. And a larger dial and meter movement increases versatility but at the expense of size.

However, even as it stands this instrument is incredibly versatile. Build it and you'll never know how you coped without it!

Friedrichshafen 2012

Keith Bainbridge VK6RK

Photo 1: A view of the Main Trader's Hall at Messe Friedrichshafen, site of Ham Radio 2012.

One warm December night I was chatting on 2 metres with Andrew VK6IA, and the subject of his trip to Friedrichshafen as part of his Europe trip in 2011 came up.

"I'm thinking of going again" he said "and my dad Peter VK6PA wants to go as well, did I fancy joining them?" It was one of those moments when you lean back in the shack chair and shout to SWMBO (She who must be obeyed) "can I go to Germany with Andrew and his dad next June?"

I never thought for one minute the reply would be "if we can afford it and if you want to, that's OK with me".

Within minutes of picking the chair off the floor, all three of us had flights booked and hotel reservations made, strike while the iron is hot was the motto of the day!

We mentioned the trip to Stuie VK6LSB a few days later and after some deliberation he decided to join us as well. The only problem was it was now January and new fare structures had come in and his fare was going to be almost twice what we had paid for ours, so sadly he could not become the fourth musketeer.

Then you sort of forget about it for months, as 20 June 2012 is a long way away.

I happened to mention the trip to my long-time friend David G3UFO; now he had always wanted to go as well, especially as members of his local club WADARC (G4MGR) have been going every year for the past 20 years or so.

Next thing is he is also booked and travelling with seven members of the club (I was a member myself 25 years ago).

20 June 2012 came around and Andrew, Peter and I met at Perth airport to start the trek halfway across the world.

Perth/Singapore/Frankfurt/ Friedrichshafen took a mammoth

28 hours of hard aircraft seats and absolutely no sleep until at 10 am local time we were in our rooms. Then showered, changed and we were off exploring the town of Friedrichshafen as it was Thursday and nothing happens till Friday!

After a few beers, a bite to eat and further exploring we decided we were dead on our feet and an early evening meal was on the cards before a good night's sleep and to the Neue Messe for a 9 am start. Well I am going for that meal now, more tomorrow. Good night.

Well it was an eventful night!! After eating, we decided to go to a bar on the Lakeside for a few drinks. Two beverages into the night the sky went black (remember this is Midsummers Day, the longest day of the year), the wind came up and the lightning started and in seconds every umbrella in the bar was blown down, tables turned over and the three of us hanging on to anything that was bolted down. The rain was torrential, so we paid our bill and ran the 400 metres to the hotel. Three drowned rats fell through the door, soaked to the skin, what a night.

I should also mention that Friedrichshafen is the home of the Zeppelin; they were first built there and we were lucky to see one every day flying over the lake, but not game to go in one I'm afraid, too expensive! There is an extensive museum in town dedicated to them. It is also the home of Dornier, the aircraft and now space engineering company which was the reason it was extensively bombed during WW2 and the town has a distinct "old but new" look to it.

Friday

Ham Radio 2012 proper started on the Friday morning with a free shuttle bus from outside the hotel door to the Messe. I was very impressed! It's HUGE!

I've been to many hamfests, radio rallies, etc. over the years both in the UK and here but this place is amazing. We were glad we had bought our tickets online before coming as the queue was endless, even with advance tickets we queued about 15 minutes to get in.

One hall is filled with Commercial traders and the International Societies stands, literally hundreds of them. On passing the Italian Society stand we heard a cry of "VK6, Rare DX, come in" and a bottle of red wine was opened and glasses poured! It's 9:35 in the morning!

Many people came up to us today with a comment of "VK6 have you come all this way just for the show?" When we said "yes", the conversations were most interesting.

We met up with Phil Harman VK6APH who is giving a lecture on the latest developments in SDR technology on Saturday morning, and he had been ambushed by a group of LA amateurs and "forced" into drinking beer at 10 am!

More on Phil's lecture in tomorrow's notes.

I then met up with the guys from the Wirral club, WADARC, including my good friend David G3UFO and others I have not seen in 25 years; compulsory pictures taken of course.

We had a chat with David K1ZZ boss of the ARRL, and with John De Voldere ON4UN and many others before spending the rest of the day going around the flea market which fill two massive halls, probably around 500 traders, I will try to find out exactly how many have attended. (NB: the fleamarket had 1000 tables and 337 traders making use of them, I never did find out how many were in the Traders and Society's Hall, but it would have been at least 100 exhibits!)

There is everything you could ever want radio wise in these halls and more.

I was looking for an amp for 10 GHz, at least 45 watts, but so far nothing in the flea market, maybe tomorrow, but I did get a four port antenna combiner for 2 metres for the princely sum of 40 Euros, that will save a lot of time and effort making one for the VK6RIO Indian Ocean beacon project.

Photo 2: The author with some friends from the Wirral and District Amateur Radio Club (UK). L-R: VK6RK, G6IIM, G3UVR, GW4OKT and G3UFO.

Photo 3: A view inside one of the flea market halls.

The Neue Messe itself is so clean and modern with many, many food outlets, restaurants, bars, toilets, creche! even a "cloakroom" where you can leave things safely while you carry on looking.

By 3:30 in the arvo we were shattered and ready for a rest, still two full days to go! So we walked out of the Messe and straight onto a shuttle bus back to the centre of the town and our hotel.

We are out to dinner with G3UFO and GW4OKT tonight, please no more storms!

Saturday

Saturday morning we were on the shuttle bus at 8:30 am, and at the Neue Messe for 8:50 and the queue was still huge to get in when the doors opened at 9 am.

We had a quick look around the Trade hall then headed off to listen to Phil Harman's lecture, what a trek! It was at the other end of the centre and took 15 minutes of fast walking to get there; did I say this place was huge? As always, Phil's update on AGC in SDR radio was very interesting, followed by Kjell LA2NI updating us on the progress of the latest SDR tx/rx. Then it got a little heavy for the three of us as the next speaker started delving into the writing of the software so we slid away, only to bump into Ben VK6XC and his wife who were at the show as part of a European trip. So far we have only met one ZL and a VK3 whose callsign I forgot to write down but who had been part of VK9NA DXpedition recently (he was wearing the shirt to prove it!) *(That would most likely have been Alan VK3XPD. Ed.)*

We spent the rest of the day in the trade hall and a brief visit to the flea market where I bought a ring feed for 2.4, 5.7 and 10 GHz, but I still couldn't find a 10 GHz amp☹.

We had been told about the Palm Radio stand with their excellent travel keys by the Gs who had bought a couple, so we tracked the stand down and were so impressed that all three of us bought one, a Palm Radio mini paddle with a code cube attached, a beautiful piece of engineering and electronics. Andrew then said, "If I've got a good portable key I need the radio to go with it", so off we went in search of the best price on an FT-817ND. He procured a very good deal and a Miracle Whip antenna to go with it. Peter acquired himself a Heil boom, shock mount and pistol grip PTT also at a good price.

Enough she cried and we headed back to the hotel.

After dinner that evening we went for a stroll and we could not believe our eyes with the sights in the street. Every year on this Saturday a cruise sets off at 8 pm down the lake, the only thing is it's a theme cruise. Everyone on board were dressed as Dominatrix and slaves, I really can't say any more in case we have readers under 18 years of age. I just wonder how many of them were amateurs as well? I thought I recognised one or two faces from the show.

We went back to the hotel, up onto the sun lounge on the roof and played HF with Andrew's new FT-817 and a Miracle Whip. We worked about a dozen stations with 3 watts and this antenna with excellent reports received from most of Europe on 20 and 40 metres.

Bed time, last day of the show tomorrow.

Sunday

Sunday and once again a beautiful day dawned. We were a bit later heading out to the Arena as the pressure was off to grab bargains.

We were there at about 9:30 am and you could certainly see the difference in numbers.

Probably a third of attendees compared to the previous two days, but still very busy.

What it did make for is a better chance to get right up to the vendors rather than struggling looking over shoulders.

We had decided to do the traders hall first and grab the things we knew we still needed then head off to the flea market and see what bargains we could pick up.

Andrew bought a couple of mobile antennas for 2 m and 70 cm, and some more bits and pieces for his new wonder radio, the FT-817.

I bought a "stealth" 2/70 mobile to go on the new car and Peter was also filling his bag with electronic nick nacks.

We then hit the flea market for a final purging. First thing was another antenna combiner, same as I'd already bought for 40 euros, for 15 euros, then a 10 GHz, 7 watt amplifier for almost 150 euros cheaper than it had been the day before. Sometimes it does pay to be patient. We picked up a few more bits and pieces then headed back to the traders hall to buy some books from the RSGB stand, but they had already finished packing up, so a quick visit to the ARRL stand (Andrew and I are both members) and we had been given pins, CDs etc. and enjoyed a good chat with the crew there.

Photo 4: Andrew VK6IA playing with his new toy.

Our club NCRG, VK6ANC was lucky to be involved a few years ago with Spiderbeam's development of a 40 m monster Spiderbeam. Con DF4SA supplied us with the material to build a 3 element 40 m Spiderbeam, the 2nd in the world.

We built it and for eight months it was an amazing antenna, then a major storm took it out, literally destroyed it. We tracked Con down and had a very interesting discussion on the antenna and his attempts to beef it up to survive storms such as we had experienced.

One final look around the traders hall and we decided our hunger had been satisfied so we said goodbye to the Neue Messe arena and headed back to the hotel to pack and to have a rest and freshen up.

We caught up with Phil VK6APH and his LA cohorts again in the evening, enjoying a meal and a beer on the lake front, such a lovely spot.

Rain is forecast for the morning and we have the prospect of a couple of hours in Friedrichshafen airport, followed by nearly six hours in Frankfurt airport to look forward to.

The trip home

Monday morning, those Monday feelings, continuous drizzle making it very clear that it is all over! David G3UFO popped over to say goodbye and let me know he's planning a trip to VK6 again to do a bit of CW contesting this October using the NCRG venue; it is always hard to say goodbye to my "Big Brother"!

Then I spent a nervous three hours in Friedrichshafen airport while I anguished over the weight of my suitcase: Allowance 23 kg, actual mass 24.9 kg. What do you leave out? I have sleep apnoea, so I have my breathing machine with me. It weighs 2.8 kg, do I leave it behind? It is my old one brought just in case this situation arose.

The final decision was to put the CPAP machine in the suitcase and put the 10 GHz amp in my hand luggage as it weighed considerably more. So I did.

Wrong decision! Going through the scanner I was pulled to one side and asked to explain what was in my hand luggage, it was swabbed for explosives and I explained what it was. Thank my lucky stars that they were used to odd things appearing on flights out of Friedrichshafen at this time of year.

But it set me thinking, what would happen at a major airport like Frankfurt and Singapore?

I was to find out, after a 6 hour wait we went through the scanners and "Bingo" I am dragged to one side and scanned all over, as was Andrew, and then the federal police took me off to a little side room. What is it, the nice policeman asked, it is a microwave amateur radio amplifier, I said. He said I thought it was an amp, I recognised it he said, my in law is an amateur, I breathe easier. They scanned it and thanked me for my patience and I was glad they had not used the "B-B" word!

It made me worry even more about Singapore, famous for its security.

The flight from Frankfurt to Singapore was every bit as bad as the trip there, hard seats, poor food and inadequate service, never fly Lufthansa again we all agreed.

Singapore was a breeze, a bit of shopping for the XYLs and sailed through the security, told the lady on the scanner I had some radio equipment and she said, no need to worry about it, heaven!

So it's all over, would we go again, most definitely! Peter is planning for next year as a side trip from his annual visit to the UK, Andrew and I may wait a little longer. I'd go every year if I could but practicalities are that maybe 2015 is a good target.

If the good woman and I can combine it with a trip to the Le Mans 24 hour race, on to a trade (work) show in Frankfurt, then Friedrichshafen, followed by a 10 day Rhine or Danube cruise, back to Le Mans for the 24 hour Classic race, UK to see the family and back home.

Sounds expensive, but it will be my retirement trip, even SWMBO cannot disagree with that, can she??

Hopefully some of the pictures we have supplied will make it into the article and you will all have your appetites whetted for a trip yourselves, you will not be disappointed.

Thanks to Andrew VK6IA and Peter VK6PA, my travelling companions and my mates from the UK, especially David G3UFO, Keith GW4OKT and Dennis G3UVR and the others and all those amateurs who stopped us and asked had we really come all this way just for the Show for making it such an enjoyable experience.

Roll on the next time!

Photo 5: The well-equipped DARC portable station set up outside one of the exhibition halls.

Flying high with ALARA

John Fisher VK3DQ

Photo 1: Jean VK3VIP in the co-pilot's seat waiting for take-off.

An unexpected invitation found Jean VK3VIP, who is the VK3 representative for ALARA, and her OM John VK3DQ take to the air as the guests of Peter VK3BFG. A maintenance issue with one of the on-board radio systems had to be checked and this required the aircraft to be flown.

The flight plan was Moorabbin to Tooradin, where we stopped for lunch and thence to Phillip Island where we made a couple of circuits of Seal Rocks and then tracked over the Mornington Peninsula crossing the coast at Dromana. We then followed the coast back to Moorabbin for a perfect landing.

As I had flown with Peter the week before, it was decided that Jean would sit in the co-pilot's seat and I would be banished to the rear seat where I would operate on two metres and 70 cm using my FT-60 hand held.

Melbourne turned on a perfect day for flying. Cessna 182 VH-CXZ was waiting for us, and after some routine paperwork was completed Peter prepared the aircraft for flight, including checking the fuel level and engine oil level and sampling the fuel at various points in the wing tanks to ensure there was no contamination or water in the fuel.

I boarded the aircraft first and then Jean took the right hand front seat and Peter the pilot's seat on the left. Jean and I were using headsets to monitor communications and intercom. After pre-flight checks the aircraft took off powerfully and set course for Tooradin. So, off we went into a clear blue sky.

Once airborne I called CQ aeronautical mobile via the VK3RSE repeater and made a number of contacts in the 30 minutes or so on the trip down to Tooradin. Approach to Tooradin was over Westernport Bay and in what seemed like no time we landed and taxied to the parking area; it was a lovely day with clear blue skies. It was lunchtime, so we partook of a nice lunch in the airport restaurant.

After lunch we boarded the aircraft, taxied to the end of the runway, took off and set course to Phillip Island, crossing French Island and Westernport Bay and reaching Phillip Island then making a right turn towards The Nobbies and Seal Rocks. I operated the radio and made a number of contacts using the hand held and of course kept a sharp eye out for 'Kodak Moments'. VH-CXZ then crossed the coast and followed it to Seal Rocks where we descended to make two low level circuits and where we were able to see the seals basking in the sunshine.

The course was then set to cross the Mornington Peninsula where we turned to follow the coast towards Moorabbin at Dromana. The seas were blue and the coastline sparkled as we flew up the coastline. Before long we began the approach to Moorabbin and Peter made another perfect landing, taxied to our parking spot and disembarked the aircraft. He then tied it down and carried out post flight checks. It was a wonderful day, one to remember and both Jean VK3VIP and I VK3DQ would like to thank Peter VK3BFG for his kindness in inviting us along.

Photo 2: Jean VK3VIP 'inspects' the Cessna 182 prior to boarding.

Wally Hannam: First Secretary of the WI of NSW

Tim Mills VK2ZTM

Photo 1: Walter Henry Hannam. Wireless operator and mechanic Australasian Antarctic Expedition 1911-1914. Photograph by Frank Hurley, courtesy Australian Antarctic Division.

Walter Henry Hannam appears to have come on the Australian experimental wireless scene about 1907 (perhaps earlier) – based on comments made by him – in referring to the difficulties (26) he was having in getting permission to conduct wireless experiments (1, 2). The Advertiser (SA) carried a story that a young NSW electrician – Mr. W. Hannam – had spent the previous .. *"three years in equipping a comprehensive plant at Burwood and had applied for a license to work it for experimental purposes" "Although one and a half years had passed since he made his first application, he had received no final answer and was in consequence unable to erect his aerial plant"* ...

Wally had been letter writing to the press with the problem which brought a response that was published in the Sydney Morning Herald (SMH) on the 4th March 1910. Under the heading ***"An Experimenter's Complaint – Conditions not complied with"***. The secretary of the Postal Department (Sir Robert Scott) ... said that the only condition which the department imposed on wireless investigators was that they must pay a royalty of 3 pounds 3 shillings a year. This entitled them to a licence to erect aerials. Mr. Hannam had applied for a licence, but had not paid the royalty. When he did, his request would be granted ... (28).

In 1910 he was 25, so it would be logical to assume he would have developed an interest in 1907 or earlier but may have delayed active interest until he finished his studies (13). He was based in Sydney and in early 1910 he was involved with an exhibition which included showing this new wireless apparatus, some of which was his. Apparently it attracted such interest that he mentioned to Mr. George Taylor (27) (a gentleman of some importance in the Sydney social scene) and together they decided that it would be beneficial to call a meeting of interested experimenters. The notice of the intended meeting - of wireless people – appeared in the publication - the "Aerial League". Taylor was heavily involved in the Aerial League of Australia, where he felt wireless would be of great use in aviation. The meeting was held on the 11th March 1910 (37), a Friday afternoon in the smoking room of the Hotel Australia (3) (at Martin Place and Castlereagh Street in the city of Sydney) and chaired by George Taylor. The meeting formed The Institute of Wireless Telegraphy of Australia (34). Wally Hannam was appointed Secretary at this meeting and confirmed at the second meeting held in April 1910 (8). He did not appear to have gained a callsign by this time, based on the newspaper reports in 1910 although his 'Golden Anniversary Card of VK2AXH' shows 'First licensed 1908' and 'Founder of the Wireless Institute of Australia 1910' (21).

Towards the end of March 1910, Hannam, Kirby and Wilkinson provided equipment and their attendance for Captain Taylor (he had military involvement) to carry out the first military test message in an exercise conducted near Heathcote to the south of Sydney. It would appear that they operated the equipment. It is unlikely that Taylor used a 'wireless' (7). After a weekend of difficulties a message was passed. There are indications in some reports that he (Taylor) may have made some use of 'wireless' in his various projects but unlikely as an experimenter in his own right.

While George Taylor chaired meetings of the new Institute it is more likely that the main mover was Wally Hannam. Taylor (27) appeared to have many interests and causes and moved in the circles of Sydney society. At various stages of his life Taylor promoted wireless broadcasting and set up various organisations such as the ***Association for Developing Wireless*** and the ***Association for the Encouragement of Wireless in Australia***, New Zealand and Fiji. On the 16th April 1925 Mr. Taylor as President of the AEWA addressed the AGM of the NSW Division, suggesting that a special fund be established to encourage experimental work (32). It appears that he made use of various experimenters for the practical side. He also experimented with early aircraft and had a factory in Redfern. He tested some of these craft at Narrabeen on 5th December 1909. He had Kirby experiment with remote control of model aircraft. In 1911 Taylor shows up in a newspaper report as Vice President of WI of NSW. He may then have drifted into other areas of interest of which there are extensive reports but no mention of 'wireless'. In the report of his funeral in the 1920's the list of those in attendance ran to several hundred names (8). Wally Hannam was not one of those listed. There were other members of the Wireless Institiute in the list.

In 1911 following representations from Hannam and Taylor to the Post Master General they were successful in having the licence fee reduced to one pound per annum (29).

On 26th January 1911 the IWT name is changed to the Wireless Institute of NSW (35).

The life span of Wally was from 1885 to 1965 (18). He was born 5 th May 1885 at Burwood in Sydney. (In Hunter Branch notes in AR there is a reference that the great uncle of John VK2XQ may have been the Doctor at Wally's birth) (22). He most likely grew up at Manly (30) but by his early 20s had moved away and lived at various Sydney locations as indicated by his call sign addresses. Noting he was born at Burwood it is interesting that he set up his wireless experiments also in Burwood. He was educated at Sydney Technical College, gaining a science diploma. One of the last records of him was as the person who opened the new hall added at the Atchison Street VK2 Headquarters in March 1962 for the NSW Division (6). A few years later (1965) a story appeared about him in a local Central Coast paper – there was a photo of him with an AR7 receiver in the background (9). Although having health problems, he attended the 1965 Central Coast Field Day. He became a Silent Key on 15th March 1965.

In researching Wally Hannam's background in the Sydney Morning Herald Archives, the name W H Hannam appears from the 1880s until about 1950. One of whom appears to have been a business man located in Sydney – manufacturing hospital equipment – Hannam's Ltd at 134 Castlereagh St. Sydney - who had involvement with Manly Hospital and lived at Manly. In the 1930s this name appears associated with sailing and fishing on Sydney Harbour. This era is confused as Wally is then living (or has an address) in Mosman, a harbour side suburb. There are Letters to the Editor (SMH) written by a W H Hannam. There are also stories of Wally in the 1920s and 30s attending reunions of the earlier Antarctic activities. Newspaper searches bring up several - W H Hannam - between 1880 and 1950. In this era it was not usual to use the christian names when reporting the activities of a person. The Australian Government Antarctic Division web site has several detailed references to Wally. His father also had the initials W.H. - William Henry - which confuses the research.

The Wireless Institute of New South Wales starts to take shape in 1910 and during this time Wally gets an invitation to take his wireless apparatus to Melbourne for use in a stage play called "By Wireless". Apparently the local manufacturer/ agent could not provide any equipment.

While in Melbourne he was approached by Douglas Mawson to go on his 1911 – 1914 Antarctic Expedition as a wireless operator and mechanic (1, 37). He is now aged 26. He took up the offer and sailing in November 1911 they went via Macquarie Island – where they set up a relay point. This had the call MQI (12) – two operators (Charles Sandell and Arthur Sawyer) (24) were left to man the Macquarie Island installation in the link back to Hobart – callsign POH (Post Office Hobart) (14). The first contact made on 4th January 1912 was between POH and MQI. It was not until either 25th September 1912 or February 1913 *(two reports differ)* that a circuit was made from the Antarctic station, Adelie Land (MAL) to Hobart (POH) via the Macquarie Island (MQI) relay point. In the early stages it appears that Macquarie Island (MQI) could hear Wally's signal but the replies were being lost in the local static noise at the Antarctic end (MAL). *(Polar sites/ paths have adverse effects on signals as DX operators will confirm.)*

There is a Frank Hurley photo of the 1911 – 1914 Australian Antarctic Expedition of Wally Hannam operating a radio when stationed at Adelie Land Station. It is also titled as "Wireless Operator Cape Denison". No date is given (about 1912/13). While details of equipment and operating details are not quoted, the mode was Morse code by spark from a 2 kW Telefunken generator (20), and the frequency would have been in the long wave spectrum. In the photo there is behind Wally an electric motor or generator which was one of the methods of producing a spark signal. This could have been a spare unit as the motor shaft has no pulley on it unless it was double ended. The petrol engine and generator to produce power for the transmitter was housed in a separate building. This photo appeared in the WIA Centenary background report in 2010 (15). Other photo's show

a workshop scene where a vice is being welded. Wally's assistant was Percy Correll. In 1913 a Sydney Jeffryes came down on the final supply voyage to Cape Denison to be a new operator (24).

Just off the Antarctic main land there are three small islands in the eastern part of Commonwealth Bay, midway between Cape Denison and Cape Gray which were named - Hannam Islands - by Douglas Mawson (11). Wally also received the Polar Medal for recognition of his part in the expedition.

He appears in a 1911 list of licensed experimenters – no call is shown (4). Address is shown as Darling Point in the Eastern Suburbs of Sydney. On a 1912 list (by the Wireless Institute of NSW) the WI Secretary is shown as Malcolm Perry (At this stage Wally was in Antarctica).

In ***Wireless in Australia***, a 1914 call book (published by the Wireless Institute of Victoria) - a W H Hannam appears as XQI in Stamford Queensland.

In World War 1 Wally served with the Australian Motor Transport Corps (11). As a member of the AIF he saw service in England and France, including a role with wireless (19). His war record (25) has him as a Corporal # 6946 in the 8th Company AASC AIF (Some sources have him at the rank of lieutenant (11)). He suffered some non-combat medical conditions and was hospitalized in both England and France. Also from the records at his enlistment (when he was 30 y 1 m) we learn that Wally was 170 cm tall, 107 kg, heavy build – chest 105 cm, dark complexion with hazel eyes, dark brown hair with C of E religion. He enlisted 2/6/1915, was overseas from 14/7/1915 to 27/1/1919 and was discharged on 7/11/1919.. His calling was shown as engineer and was listed as 'not married' giving his father as next of kin.

With WW1 over, the WI of NSW is the first to hold a meeting - 7th January 1919 (35). May 20th 1919 at the second meeting of the WI of Victoria a letter was received from WI of NSW suggesting the formation of the WIA (36).

In the 1924 callsign lists and again in 1928 Wally shows up as 2YH at 449 Darling St. Balmain which has his surname spelt with an 'n' – Hannan.

In 1926 the Institute is getting ready for the third Annual Federal Convention to be held in Sydney. There is also a reference to holding an Exhibition but the date was deferred due to the closeness of the Federal Convention (10). From the minutes of a Delegates Council Meeting – 10th September 1926 – they dealt with Traffic tests, features of the upcoming Convention which was to include a motor tour of the South Coast, the Annual Dinner and a major Institute meeting and all radio clubs were urged to give these functions their fullest support. The Chairman of these Delegate meetings was Ross Hull who was to return to America in a week, leaving a vacancy. After discussion they requested Mr. Hannam to accept the appointment as Chairman. The minutes conclude with an appreciation from the Leichhardt Club re a visit to 2WI, but they regretted that one of their members attending expressed sentiments 'which were distasteful and not in accordance with the opinions of other members of the (Leichhardt) Club'. The next meeting was 8th October 1926 and the minutes were signed by W Hannam as Chairman.

In 1925, 1926, 1929 and 1930, (VK) 2YH W H Hannam address is at "Glen Osmond" 23 Prince Albert St. Mosman which is down towards Taronga Zoo. This building was still there in 2010, a large two story structure with an extensive view of Sydney Harbour to its west, including the Bridge and the CBD.

In 1927 the Waverley club celebrated its eigth anniversary with several club representatives in attendance and Wally also attends – most likely on behalf of the WIA. He proposed the health of the new club – was reported in the SMH for 11 th February 1927.

In 1931 – VK2YH: The address for Wally is shown as 15 Thompson Street, Mosman. This is nearby to the previous Mosman address.

In 1936 – VK2YH: W H Hannam (portable) is now living at 201 Mowbray Rd. Willoughby. In 1938 the Portable has been dropped. This property was still there in 2010, a large single story building on a large corner block.

Also in this 1938 call book list there is a H W Hannam VK2IR at 109 Sale Street Orange. This person appeared in later callbooks, having moved to South Hurstville, Sydney. The Orange location in 2010 was used as medical rooms for Mid West Ophthalmology.

In May 1939 Wally's Mowbray Rd. home is burgled and he loses all his medals. In April 1941 he seeks replacement medals so he can take part in the 1941 Anzac Day (25). These were replaced in time. Also replaced were the Polar medals.

By the start of WW2 Wally is 55 years old. No records have been found of his activities in this period. Amateur radio was curtailed for the war's duration. There were some PMG lists put out after 1946 until about 1950 but there is no listing of Wally having resumed amateur radio activities or acquired a callsign. The first time he appears is in a 1954 callbook and listed as VK2AXH. This callbook was the first to be published since 1950 and was produced by the WIA as distinct from previous callbooks published by the PMG's Department. The three letter 'A's' call signs were being issued in sequence and did not reach up to the 'AX*' stage until well into the 1950s.

In 1948, his former call VK2YH was issued to C. Aston of Marrickville and who later moved to Riverstone (17).

In 1949 (24th January) Wally makes contact with the AIF Repatriation Commission. He is now approaching 65.

Sometime from about 1950 onwards Wally appears to have moved to Terrigal for the remainder of his life, where he seemed to have acquired the nickname 'The Terrigal Tiger". In the 1954 and later

Photo 2: Walter Henry Hannam at the wireless console. Photograph by Frank Hurley, courtesy Australian Antarctic Division.

callbooks he appears as VK2AXH at 32 Hillcrest Rd. Terrigal (a small house block in a steep no through street) on the NSW Central Coast. He appears to have resumed and then maintained his amateur radio activities until the end (20). Peter Christie recalls – as a child – that his family was associated on the Central Coast with Wally via a family connection (39).

In 1955 he has a holiday in the New Zealand South Island and is interviewed by Radio NZ where he relates much of his early days (5).

In 1958 Wally is hard at work in the shack and he contributes to *AR* magazine four Hints and Kinks items which are published in August 1958, page 13. An all band RF Choke, Tuning rods for IF transformers, Flux for nichrome and nickel and making rods for chokes, etc from perspex strips.

In 1960 the ACT suburb of Mawson is developed with streets named after members of the 1911-1914 Expedition. There is a Hannam Place (31).

On the 17th March 1962 he is the guest of honour and opens the new hall at Wireless Institute Centre for the NSW Division at 14 Atchison Street, St. Leonards (6).

In 1965 he attended the Central Coast Field Day (20) and also appears as a front page story in a local NSW Central Coast paper (9).

His Silent Key and Obituary is in June 1965 *Amateur Radio*. He passed away at his Terrigal home on 15 March 1965. His funeral was held at the Sydney Northern Suburbs Crematorium on 17 March 1965 (20). This was three years to the day after he opened the Atchison Street hall.

In 1968 a Mr. D J Croll of Collaroy Plateau, in possession of his medals, seeks Wally's war records (25).

A letter in May 1984 *Amateur Radio*- from his eldest nephew (John Bathgate from near Tamworth) brings to the attention of the amateur movement that Project Blizzard was being under taken to restore Mawson's Hut. John requested support for the project as a fitting tribute to Walter Hannam (19). There was also references (in 1986) that the Redcliffe Radio Club had many photographs from the 1911 Cape Denison radio shack. The Project Blizzard operation received a lot of support, including from Dick Smith VK2DIK who provided the Dick Smith Explorer that sailed down to the site as the Project base. Pierce Healy VK2APQ who manned the Australian end of the communication link and various radio amateurs who monitored the operation. Project Blizzard was well reported in the electronics press like *Amateur Radio* magazine and *Radio Television and Hobbies* (40).

Wally is also credited in Antarctic records with the call VK2QI (11) but this may have been a confusion with his Queensland call XQI. In these reports there is also a error in the year he died. Their record shows 1964 – it was actually in 1965.

In a tape recording (6) made toward the end of his life he had strong thoughts about the (then)

recently introduced Limited Licence – he was apparently of the 'old school' that you were not a real amateur unless you had qualifications in 'Morse'.

What did he do after World War 1? There was some involvement with the Wireless Institute – at least in the 1920s (10). Another reported his activities with the "Australian Wireless Association until his death in 1964" (11). There are indications that he worked in the family business (Hannam's Ltd) which manufactured hospital equipment and operating tables. There are many reports in the Sydney Morning Herald pre 1900 to about the start of WW2 where the name Hannam is associated with this type of manufacturing. He was one of six children (30), perhaps the eldest. There is a reference to a brother (23) and there were at least two sisters (19), Eva and Jessie (38). Few details have been found as to other close family. None were mentioned in his Obituary (20). It is understood that he married late in life. There were no children (33).

In the 25th Anniversary issue of *Amateur Radio* magazine (October 1958) there is a feature report on VK2WI and included is a list of Life Members of the NSW Division (16). While there are several members listed from the early days, Wally was not one of them. Surprising that his original efforts were not acknowledged by the organization he did so much to form.

December 2011 is the Centenary of Mawson Expedition landing on the Antarctic mainland.

A Centenary function and dinner was planned in Tasmania to which invitations were extended to decendants of the original team who were on the 1911 – 1914 operation.

Australia Post on the 2nd August 2011 made a special stamp issue to commemorate the expedition. There are five stamps in the set.

These are some of the available details. Can you contribute?

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References

1. 1955 Radio New Zealand interview.
2. At this stage in his mid twenties.
3. Telegraph and Sydney Morning Herald reports of the meeting. 12th and 14th March 1910.
4. Story on Australian callsigns by VK2CZ.
5. 1955 Radio New Zealand interview, held by the Kurrajong Radio Museum.
6. Plaque and tape recording held by ARNSW.
7. Amateur Radio June 2010, Engadine News March 2010.
8. SMH archives.
9. Remembered by Ian VK2ZIO who was teaching at Narara Public School at the time.
10. WIA archives.
11. Antarctic Division archives. (Life span 1885 to 1964)
12. 1912 callsign list of the WI of NSW.
13. Mawsons Huts web site.
14. PO* stood for Post Office – later changed to VI* (4)
15. WIA Centenary report at www.wia.org.au
16. *Amateur Radio* magazine October 1958.
17. *Amateur Radio* for July 1948 – page 17.
18. June 1965 *AR* – page 23 – lists his Silent Key.
19. May 1984 *AR* – Letter from John Bathgate
20. *Amateur Radio* June 1965 – page 27.
21. *Amateur Radio* May 1986 – page 58 Letter in 'Over to You'.
22. *Amateur Radio* April 1961 – page 21. Hunter Branch notes.
23. Tape recording of 'the Christmas message' with reference to having lottery tickets with his father and brother.
24. The Finger Tappers – Mawson Huts.
25. Australian Military Forces web sites.
26. The Advertiser – Adelaide Thursday 10 March 1910.
27. George Augustine Taylor 1872 – 1928 http://www.ctie.monash.edu.au/hargrave/taylor_bio.html
28. SMH 4 March 1910, page 6.
29. SMH report.
30. Report of William Hannam death 10 th January 1935. SMH 11 January 1935 – page 6. Born England 1854, died Pymble 1935. Also from Manly Daily Pictorial 15/9/31.
31. Site 493 – Low – Latitude Antarctic Gazettee.
32. SMH Friday 17 April 1925, page 12.
33. Advised by Peter VK2AQJ based on what he was told by Phil Crocker (SK).
34. *AR* January 1985 IREE.
35. VK4SS in ARA November 1987
36. Melbourne Herald 21 May 1919.
37. Sounds of Amateur Radio Vol 2 CD Part 1 – voice of Wally re first meeting and Antarctic.
38. From Flip (Hurley) Byrnes.
39. Peter Christie at a meeting in 2011.
40. Project Blizzard - Restoring Mawson's Hut.

WI of NSW = Wireless Institute of New South Wales.

There are two Frank Hurley photos of Wally in the Australian Antarctic Division report on 'Wally Hannam' http://www.aad.gov.au/default.asp?casid=35170

The first is head and upper body shot of Wally in an army great coat and cap outside a snow and ice covered building. The second is 'Hannam and the wireless instruments at Cape Denison. The one which is in the WIA report (15). These two photos appear in this report, thanks to the Australian Antarctic Division.

A photo of Wally appears in the WIA Book Vol 1 – opposite page 64.

Research by Tim Mills VK2ZTM. Thanks to various sources, including Ian VK2ZIO, Richard VK2SKY, Henry VK2ZHE and Peter VK3RV – WIA Time Line.

Additional information is always sought for this report. It can be supplied to Amateur Radio New South Wales or to the author:- *vk2ztm@wia.org.au*

VK2 news

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Last month was AGM time with many clubs including Oxley Region ARC, Illawarra ARS and Orange and District ARC. Welcome to the new members on those committees and thanks to the old members who put their hand up again or were slow getting out the door. Last month also had a lot of activities like the RD; did you remember to submit a log? WICEN had the annual Shahzada horse enduro over the last week. There was the Lighthouse and Lightship weekend with clubs right along the coast line. Blue Mountains have just had Winterfest and Summerland ARC had SARCFEST early in the month. At month's end the annual IPS Propagation course was held in Sydney.

This month has Waverley ARS with a two day Foundation course on the 8th and 9th. ARNSW will have a one day Foundation course on Sunday the 23rd with assessments for all licence grades on Sunday the 30th. This is also the day of the next Trash & Treasure at VK2WI Dural in the morning with the Radio and Homebrew meeting in the afternoon. WICEN has the Trek for Timor on Saturday the 15th and registration and contact by email *operation@nsw.wicen.org.au* Westlakes ARC have their annual field day on Sunday the 16th at the club rooms.

Towards the end of the year NSW Police Rescue has a 70th anniversary dinner planned in early October. The Hellenic Amateur Radio Association of Australia will have a major DXpedition to Campbell Island in November under the call ZL9HR. In early December the Hunter Radio Group will have their social dinner evening.

73. Tim VK2ZTM.

Silent Key

Geoffrey Erle Switzer VK2SR

Geoff Switzer VK2SR passed away peacefully surrounded by his family on 7 March 2012 after a short illness.

Geoff was born in Grafton in 1922. He was involved with radio from an early age when he was allowed to go to the 2GF transmitter early in the morning to switch it on and warm up the tubes.

Geoff trained as an electrician and worked on government electrical contracts as part of the war effort and later joined the Army where he was drafted into searchlights with the 60th AASL Company in Newcastle. He trained for searchlight radar in Sydney and later radio physics at South Head.

Geoff started work at the Federal Match Company in Grafton in 1945 where he worked for 39 years, designing much of the machinery and managing the factory for many years until it closed in 1984.

He married Dorothy Smith in 1951 and they had four daughters Julie, Kaye, Lyndall and Heather.

Geoff's amateur radio career started officially on 27th May 1948 with issue of Experimental Licence No 7843.

His WIA Membership Certificate No S51 is dated 1st November 1948.

Geoff formed many lifelong associations through amateur radio in VK and ZL and through involvement with Rotary Youth Exchange in ZS and JA.

Dorothy told me recently that although Geoff had many long term radio acquaintances; he was disappointed that conditions did not allow contacts in recent years and that many had become SK.

Geoff was a mentor to me as a Novice and his knowledge and experience with valve transmitters was impressive. He contributed several technical articles to the WIA magazine.

In addition to his involvement in amateur radio Geoff gave commendable service to Rotary, the Grafton TAFE committee, Legacy and Prince Leopold Lodge.

Contributed by Tony Smith VK2VL.

Spotlight on **SWLing**

Robin L. Harwood VK7RH
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September usually means that spring has arrived, although I am writing this at the end of July. Here in Launceston it has been foggy, damp and very depressing, especially for me. I am constantly fighting these on-going hearing demons which make it extremely frustrating for me to actually monitor the bands. Just when I think it is getting better, the whole cycle commences and I end up being totally deaf for a while.

July did indeed see the BBC World Service finally vacate the historic Bush House in the Strand, after occupying it for over 70 years. I was able to listen to the final news broadcast via Foxtel at 1100 on Thursday July 12th. I actually did not realise that it was covered live on the BBC World TV, until it had ended yet was able to watch it on later playback on the internet. All of the external services have now relocated to a multi-story building alongside the equally historic Portland Place site of Broadcasting House, home of the BBC's domestic radio networks. I had not realised that Bush House itself was bombed during the Second World War with the tragic loss of 41 lives. It was the target of a German V-1 doodlebug in June 1944.

Radio Canada International indeed ceased on the 24th of June and the final rebroadcasts from Sackville for the Vatican Radio and NHK indeed ended on the 31st. There will not be any reprieve as I am informed that the Sackville site will be quickly demolished. Interestingly the small CBC domestic relays at St. John and Vancouver are continuing but I suspect for not much longer. One of them has drifted off channel causing a heterodyne for the other station as they share the same channel. Some of you may have heard the special service for the sparsely populated northern parts of the Dominion on 9625 kHz. Well this too closed as a string of low-powered repeaters on FM are due to be quickly brought online.

The Vatican also closed some services but ironically the daily Latin Mass continues at 0530 yet on fewer channels than previously. Broadcasts of the Sunday Mass also continues. I believe that it has commenced using the Montisiery site in French Guiana instead of Bonaire which is slated for closure at the end of the a-12 period. Also the Madagascar site of RNW has been purchased by former employees and will presumably operate in a similar manner to Babcock.

July also saw elections in Papua-Nuigini after a tense constitutional crisis. This saw the reactivation of several provincial stations on shortwave plus the former senders near Port Moresby. 6040 came back on with election returns and apparently was a continuing simulcast from Kundu TV. The elections defused the constitutional crisis and as a bonus seem to become an impetus to revive the dormant shortwave outlets for the time being.

The civil war in Syria is becoming even bloodier and threatens to explode the entire Middle East. Syria does have a shortwave presence but it is barely modulated and rarely heard. I believe it is on 9330 but have not personally observed it. Under-modulation seems to be the norm as Cairo routinely does this. They broadcast to Australia apparently but are rarely heard because of the persistent under-modulation. When they do crank it up they go overboard, resulting in horrible distortion. Apparently the administrations are pouring in resources to satellite TV and ignoring shortwave.

Well that is all for this month and I do hope that this hearing hassle does cease, allowing me to get back to monitoring once more.

73 de VK7RH

WIA Contest Website

To keep up to date with all of the major Australian contests, including rules and results, at the WIA Contest Website at:
www.wia.org.au/members/contests/about

VHF/UHF - An Expanding World

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Weak Signal

It can sometimes be forgotten that, as radio amateurs, we are very privileged. Looking at all the discussions, manoeuvrings and talks of mega-dollar auctions that are going on with regard to the slabs of RF spectrum that will be freed up as the analogue TV system is closed down, we should remind ourselves that we have use of a very valuable resource in the form of the frequency allocations set aside for amateur radio. Commercial pressures on the ACMA for access to these frequency bands must be enormous.

In recent times, we have been generously granted even greater spectrum portions in LF, MF and HF regions. We should treat them and all of our other allocations as precious objects.

Loss of 420-430 MHz

Unfortunately there are also some losses. For several years, use of the 420 to 430 MHz segment of the 70 cm amateur band has been restricted to Advanced licensees and further restricted by various exclusion zones in NSW, the ACT, Sydney, Perth and Melbourne. Recently, the ACMA has advised the WIA that this segment will be withdrawn from general amateur use from 1st January 2013. There are a number of repeater links within this segment that are affected. The WIA is currently negotiating with the appropriate parties as to whether the links may continue to operate within this segment or whether the licensees affected – mainly clubs - will be required to relocate them into the 430 to 450 MHz region.

In addition, as part of the re-organization of the land mobile service, the ACMA has indicated that the segment 440 to 450 MHz may be used on a temporary basis by displaced land mobile services until they are relocated during a transition phase. We should be active and vigilant in ensuring that this segment does not also go the way of the lowest 10 MHz of the 70 cm band.

Threat to 10 GHz

One of the most popular microwave bands would have to be 10 GHz. We are privileged with 500 MHz of spectrum from 10.0 to 10.5 GHz with amateur radio as a secondary service. Most weak signal operation occurs around 10.368 MHz, being an exact multiple of 144 MHz.

On this band, homebrewing of equipment is still practical without the need for exotic test equipment. As well, there is a lot of ex-commercial microwave link equipment originally operating on 10.5 GHz and 14 GHz that can be easily modified to work in our area of the spectrum – Mitec, Qualcomm and the MaCom "Whitebox" being just a few.

At the recent WRC conference, one of the activities undertaken was the setting of the agenda for the next conference in 2015. Of particular note is the following item:

Agenda item 1.12 to consider an extension of the current worldwide allocation to the Earth exploration-satellite (active) service in the frequency band 9 300-9 900 MHz by up to 600 MHz within the frequency bands 8 700-9 300 MHz and/or 9 900-10 500 MHz, in accordance with Resolution 651 (WRC-12).

Active remote sensing satellites gather topographical data of the Earth's surface using synthetic aperture radars (SARs). The frequencies around 9 GHz are ideal for such applications. While there was no action taken with respect to the existing allocation of the 9.3 to 9.9 GHz band to the Earth exploration-satellite service, the Conference agreed to Agenda item 1.12 for WRC-15 which will consider the possible expansion of the existing X-band allocation by up to 600 MHz.

Given that there appear to be several options, if we can make our voice heard and demonstrate our need for this band, then the hope is that any decision will favour leaving our segment alone.

Threat to 76 GHz

The amateur service has 5 GHz of spectrum allocation from 76 to 81 GHz, with the portion from 77.5 to 78 GHz as a primary allocation (the remainder as secondary). While some may say that the 76 GHz band is getting into the realms of the esoteric, the same thing was thought of 10 GHz not so many years ago. At the recent GippsTech conference, Alan VK3XPD and Michael VK3KH showed that operation on the 76 GHz band was possible with relatively simple equipment.

At the recent WRC conference, another Agenda item for the WRC-15 conference is of concern:

Agenda item 1.18 to consider a primary allocation to the radiolocation service for automotive applications in the 77.5-78.0 GHz frequency band in accordance with Resolution 654 (WRC-12)

- *An allocation of spectrum that is compatible worldwide would be beneficial in terms of efficient use of spectrum and economies of scale*
- *The 77-81 GHz frequency band is considered to be a possible suitable band for automotive radars*
- *ITU-R will conduct the appropriate technical, operational and regulatory studies to consider a primary allocation to the radiolocation service in the 77.5-78 GHz frequency band*

Our primary allocation in the 76 GHz band is under threat for use by vehicle active cruise control radars. One could imagine the chaos as the Mercedes, on full autopilot, pulls into the mountaintop car park where you are operating. A burst of CW on 78 GHz causes the Merc to lunge into the rear of the Volvo that arrived during the last over, causing massive interference to your reception.

Even though this re-allocation is probably already a done deal given that vehicles are already being made with these radars, we should not just roll over, but negotiate something in exchange for our loss of privilege.

Ironically, the advent of 76 GHz radar systems in the consumer segment (albeit high-end) may result longer-term in a source of surplus equipment for conversion to amateur use. Keep an eye out for a late-model Merc in the wrecker's yard.

Publicising activity

All this demonstrates that we should be active about protecting our frequency allocations. By active, I mean that we should get out and use the bands and publicise the activity. It's important that all those stations active on any microwave bands, and particularly 10 GHz, should post Spots on the VK Logger and write about their activities on the Logger forum, and VK-VHF and VK-Microwave mail lists.

As well, I welcome any submissions on your activities, even if they are just benchtop developments. There is much going on in the amateur microwave regions and we urgently need to tell everyone about it.

VK3 microwave tune up day

Discussions have recently started about having a microwave tune up day in the Melbourne area late in the year. The idea is that people can set up their systems and check the sensitivity, output power, dish efficiency, frequency accuracy and stability. Date and venue have yet to be determined, but take this as an early warning so that you can have your system ready in time.

Vale Steve Powlishen K1FO

It was sad to hear recently that Steve K1FO passed away at the young age of 60 years. Anyone who has dabbled in the VHF/UHF area will have heard of K1FO. His Yagi antenna designs were the standard in ARRL publications for many years. He produced many VHF/UHF RF power amplifier designs that were built by amateurs around the world. He was also an avid EME operator himself using, of course, Yagis and amplifiers of his own design. His presence and expertise will be greatly missed.

Winter VHF/UHF Field Day results

Congratulations must go to those hardy souls who participated in the recent Winter VHF/UHF Field Day. For the first time, VK2 stations have won three sections - and also for the first time, VK3 stations won nothing.

Congratulations to the section winners:

- Matt VK2DAG – Single Operator, 24 Hours
- Steven VK2XDE – Single Operator, 8 Hours
- Sunshine Coast Amateur Radio Club VK4WIS – Multi Operator, 24 Hours
- Redcliffe and Districts Radio Club VK4IZ - Multi Operator, 8 Hours
- Keith VK5AKM – Home Station, 24 Hours
- Justin VK2CU – Rover Station, 24 Hours

The next VHF/UHF Field Day is the Spring event on the weekend of 24-25 November.

Please send any Weak Signal reports to David VK3HZ at *vk3hz@wia.org.au*

Digital DX Modes

Rex Moncur VK7MO

Tropo-Scatter on 24 GHz

To date most contacts on 24 GHz in VK have been over line of sight paths or due to occasional ducting. Rex VK7MO and Dave VK3HZ have been exploring the use of tropo-scatter on 24 GHz to complete grid squares where a line of sight path is not available. The equipment used is 1.5 and 3 watts and 40 cm dishes. With SSB, tropo-scatter paths of up to 170 km have been completed when absorption is low but the additional sensitivity of JT65c has allowed tropo-scatter contacts of up to 268 km. A key issue on 24 GHz is absorption due to water vapour and it has been found that forecasts of Precipitable Water (PW) give a good indication of this loss. PW is defined as the amount of water that would be found if all the water vapour and any liquid water in a column from the surface to the top of the atmosphere were condensed. In Australia PW is typically in the range 5 to 50 mm resulting in losses of 15 to 150 dB on a 250 km tropo-scatter path. As a rough guide it is found that absorption losses on tropo-scatter paths can be approximated by:

Absorption Loss (dB) = 0.012 * PW (mm) * distance (km)

Thus for PW of 10 mm over a 250 km path the absorption loss will be around 30 dB reducing to 15 dB on

the few occasions each year that PW is down as low as 5 mm.

Forecasts of Precipitable Water up to six days in advance are available at:
http://wxmaps.org/pix/aus.pw.html

Table 1 shows the JT65c signal levels that have been achieved (and failures) over various tropo-scatter paths with generally close to zero take-off angles. All QSOs or attempts listed were back to Mt Macedon in QF22.

The use of a single 1270 Hz tone on JT65 is a useful way to find a very weak signal on the waterfall display and gives around 4 dB improvement. 1270 Hz is chosen to coincide with the normal sync tone frequency of JT65 so that when one moves to send messages one knows exactly where to look on the waterfall. To transmit a 1270 Hz tone, insert '@1270' in any message box. On very weak signals it is also useful to use single tone messages to transmit RRR and 73 and take advantage of the 4 dB improvement. RRR is transmitted with the single tone '@1595' and 73 with '@1700'.

Please send any Digital DX Modes reports to Rex VK7MO at *rmoncur@bigpond.net.au*

Grid Locator	Distance (km)	Average PW (mm)	Signal to Noise (dB) on WSJT scale
QF15	268	6	-29
QF01	244	9	-30
QF03	242	18	Nil
QF03	242	14	Nil
QF03	242	10	-27
QF02*	233	9	-30
QF34	220	9	-17
QF24	197	9	-18

Table 1. ** Take-off angle of +0.7 degrees costing around 7 dB*

The Magic Band – 6 m DX

Brian Cleland VK5BC

July was another quiet month on 6 m with only a few winter 'E' openings and some evening TEP openings in northern VK late in the month.

The 3rd of July saw many reports of contacts down the east coast from VK4 to VK2, 3 and 7 with Phil VK4FIL reporting contacts with VK1KW, VK2ZQ, VK2ZM, VK3BBB, VK3DUT, VK3AJN and VK7DX. The band also opened from southern VK2 and VK3 to northern VK4 with Leigh VK2KRR reporting Lloyd VK4FP in Townsville at +9 on WSPR.

On 8th July the band opened from VK2 to ZL and VK2 to northern VK4. Mark ZL2WHO worked several VK2's including John VK2BHO, Mike VK2ZQ, Brett VK2FZR as well as Frank VK7DX.

Bob ZL1RS worked several VK2 and 4s from Sydney to Townsville on the 10th July and the band again opened from ZL to VK2 and 3 on 13th July with ZL3ADT, ZL2TPY, ZL2WHO and ZL3NW also in the action.

Good opening on the 18th July from VK5 to VK2 and 4 with Col VK5DK in Mt Gambier completing several contacts including VK4AQF, AFL and AMG. Brian VK5BC/p Corny Point also completed with VK2BXT, VK2TS, VK4EK, VK4AMG and VK4WTN.

The 27th July produced the best opening for the winter with the band opening over most of VK including NW VK6. The VK6RSX beacon in Dampier was audible in VK3, 5 and 7 for 2-3 hours with Michael VK6BHY in Karratha working Steve VK3ZAZ, Norm VK3DUT and Frank VK7DX. In VK5 stations could be heard from VK2, 3, 4, 6 and throughout the afternoon with several short skip contacts into VK3 completed. Brian VK5BC worked Kevin VK3AKC, Norm VK3DUT, David VK3ANP and Oly VK3XDX. Frank VK7DX worked VK5KAA, Jeff VK5GF and Brian VK5BC as well as Trevor VK4AFL and Ross VK4QM.

The band again opened from VK5 to VK6 on the 28th July.

Both the Perth VK6RPH and Bunbury VK6RBU beacons were audible for over two hours but only two VK6 stations were heard and worked. Peter VK6KXW worked Peter VK5PJ in three modes, SSB, CW and RTTY and VK5BC in SSB. Wayne VK6JR near Bunbury worked Garry VK5ZK and Brian VK5BC.

On 29th July Frank VK7DX had a good opening to ZL3 working ZL3ADT 58/58, ZL3NW 59/59 and ZL3AAU 59/59.

Gary VK8AW in Darwin reports hearing JA beacons in the evening of the 23rd July and Hiro JR2HCN reported hearing both the Darwin VK8VF and Townsville VK4RTL beacons in the evening of 31st July.

Meanwhile in Exmouth NW VK6, Rex VK6ARW has been busy building a Loop Fed Array Yagi for 6 m and hopes to have it in the air shortly.

Photo 1: Rex VK6ARW with his new LFA Yagi.

If you are interested in trying to figure out the vagaries of 6 m propagation, an interesting paper can be found at this site;
http://www.ham-radio.com/n6ca/50MHz/K6MIO_50MHz_F2Prop.pdf

Please send any 6 m information to Brian VK5BC at *briancleland@bigpond.com*

VK5news Adelaide Hills Amateur Radio Society

Christine Taylor VK5CTY

The most recent meeting was a little different to most. We had David VK5FDAL bring along the beautiful drilling rig he has devised with which to drill circuit boards to an incredible degree of precision.

He started off with three stepper motors, took them apart and machined the parts to a level of accuracy not normally needed in stepper motors. He mounted the motors in a solid frame so one motor controlled each of the x, y, and z axis. The need for the x and y axis is obvious but by adding the z axis David can etch a board as well as drill it.

He brought along a number of item to pass around, including a three coloured array of LEDs that he has programmed to switch through a sequence. He also started the drilling process required for this board, using a 0.8 mm drill and drilling holes about 1.5 mm apart. To even drill holes this diameter you can expect to break a number for each project but David's 'drill press' is so accurate that he only has to change a drill bit when it becomes blunt.

To demonstrate the etching ability David passed around a number of 'fun' items, a dinosaur, a 'name tag', a conrod, and a model for a casting, all in 3D. To

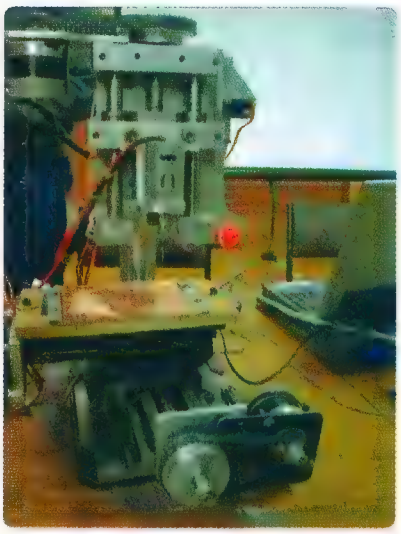

Photo 1: The precision drilling rig of David VK5FDAL.

demonstrate that he can etch onto a curved surface he scribed 'SAPUG' onto a piece of plastic. Altogether it was a very interesting and convincing demonstration.

In his employment David was dealing with supercomputers but he has put much simpler computers to work for this machine. All the drawings and instructions are made through a program like 'Protel' with which many amateurs would be familiar.

After supper Rob VK5RG spoke about the 5 MHz band and the possibility that this may become available to amateurs in the future. He also pointed out that it is being used by ARNSW in NSW for the Sunday morning broadcast (from VK2WI on 5.425 MHz, as well as on a number of other frequencies).

Although we may not transmit in this band we can listen to it. He suggested that it would be worthwhile listening on 5 MHz when the 3.5 MHz band 'dies', for example, during a contest, and before the 7 MHz band opens as the ionospheric conditions change, simply as a means of being able to predict the 'opening' you are waiting for.

AHARS has a regular meeting in the Blackwood Senior Citizens hall on the third Thursday of each month to which all visitors are welcome.

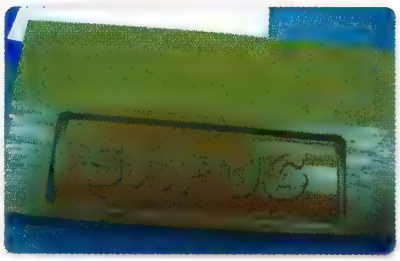

Photo 2: Showing the capacity of David VK5FDAL to etch on to a curved surface.

Visit our Bookshop

Weekend Projects for the Radio Amateur

Weekend Projects for the Radio Amateur is broken down into two main parts: Build It Yourself and Reference with the first part split further into three sections Aerials, General and Station Accessories. The Aerials section, contains, six antennas for you to try along with information on erecting antennas and their maintenance. Moving on the reader is treated to a design for an 80 m transceiver and getting into the 10 GHz band in the General section. The Station Accessories section is huge, containing dozens of projects covering everything from a dry cell tester and ni-cad chargers through ATU designs and much more. The books Reference part is packed with articles to maximise the hobby. There are articles on oscilloscopes, noise reduction circuits, radiation resistance along with guides to HF Contesting and getting started on a shoestring.

Product Details

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ALARA

Margaret Blight VK3FMAB – Publicity Officer

One of the overseas participants at the YL International Meet earlier this year was Unni Gran LA6RHA from Norway. Most of the YL members I have met seem to be people with a variety of interests. Unni is no exception. She has served in the Army Reserve in Norway and has developed skills in casualty makeup. So she is often called upon to demonstrate these skills when there is a rehearsal for a casualty training exercise, either for the armed services or civilian organisations.

It was interesting to listen to a conversation between Unni and Jenny VK5FJAY who is a long-time member of the St. John's Ambulance Brigade in South Australia, as they compared notes on how best to reproduce a realistic wound during an exercise. The latest news on Unni is that she has travelled to Fair Isle near Scotland to participate in another training exercise. Her skills certainly give her the opportunity to travel and no doubt she will be on the air while she is there.

Photo 1: Pat VK3OZ and Joline ZK1UJB.

How to become a sponsor

I was recently asked to become a sponsor to a WARO member from New Zealand. Shortly afterwards I received the following email from Dot VK2DB. Having read the email you can see why I agreed and Joline and I have been corresponding happily ever since.

Photo 2: Darwin group travellers and Darwin Amateur Radio Club members.

'Hello Margaret,
We have found a wonderful sponsor for you. Joline ZL1UJB. She is a delightful, clever, funny lady with a delicious sense of humour and I'm sure you'll both get on well together. 33 Dot VK2DB.'

YL International: A final note - Tina Clogg VK5TMC - Vice President.

Everyone is certainly home from the YL International 2012. As the organizer I am ecstatic that everything went off as planned and everyone seemed to enjoy the activities and the company. I want to add a final thank you to the Darwin Amateur Radio Club for the wonderful BBQ they put on for us at their clubroom. It certainly made for an interesting morning while most of our group was waiting for their plane departures. My OM and I also stopped by the DARC clubrooms the following Thursday to have a cuppa with those who had gathered at their regular weekly meeting.

We don't have a proposed location for the 2014 YL International yet. But we do have the ALARAMEET in Nelson Bay, NSW, in October 2014, to look forward to. Other international meetings that we hope to attend are SEANET 2012 in Kuala Lumpa in November and the SYLRA Meet in Copenhagen in August 2013.

News from VK3

The Gippsland Gate Radio Club held their annual Hamfest in July. Although the weather was cool, the rain held off, so the barbeque was set up outside the hall and other refreshments were available in the kitchen. A number of ALARA members joined in to help make the occasion a success.

Photo 3: L-R. Susan VK3UMM, Pat VK3OZ, Jean VK3VIP, Margaret VK3FMAB, Dianne VK3FDIZ, and YLs Jenny and Naree.

Birthday luncheon

ALARA members and OMs gathered in Sunbury to celebrate 37 years since the commencement of ALARA.

Photo 4: L to R - Rina, Jenny VK3WQ, Elaine VK3EQY, Susan VK3UMM, Jean VK3VIP, Margaret VK3FMAB, Dianne VK3FDIZ, and Margaret.

Photo 6: Our Lollygirl Dianne VK3FDIZ.

The weather was wet and cold but the welcome from host Jenny VK3WQ and her OM Peter was welcoming. Hot soup and snacks soon warmed everyone up and everyone enjoyed the afternoon's entertainment. This included a video of Norma VK2YL giving an address to the WIA Conference in Canberra on the origins and history of ALARA and women in radio.

The birthday cake was cut and distributed by Jenny VK3WQ and Jean VK3VIP and ice creams were provided by our talented Lollygirl Dianne VK3FDIZ. It was a fun afternoon.

VK5 news

Christine VK5CTY enjoyed an ALARA lunch with other YLs in Adelaide. They decided to liven things up by making it a Red Hat Day.

Photo 5: Jenny VK3WQ and Jean VK3VIP cutting the birthday cake.

Photo 7: L to R - Jenny VK5FJAY, Shirley VK5YL, Sharon ZL3AE, Tina VK5TMC, Myrna VK5YW, Meg VK5YG, Christine VK5CTY and Jeanne VK5OQ.

Over to you

Amateur history

Dear Editor,

I read with great pleasure Keith Williams historical article about his father VK3WE, in August *Amateur Radio* magazine. Having researched my family history, I lament not having spoken in particular to my grandparents about the changes they lived through. They all were born in the 1890s and as such grew up from there being no radio to radio's beginnings in the 1920s. This must have been a monumental change from having no instantaneous information and entertainment to having it. The transition would have been much greater than what I lived through, the introduction of television and of now the Internet. Going from nothing to something is always greater.

I hope our Australian amateur history is not lost. I am at present scanning *Amateur Radio* magazine, continuing on from the 1933 to 1939 series and you cannot help but read some of the articles. These old *AR* magazines have a wealth of our Amateur Radio history and hopefully will be available for all to read, research and enjoy soon.

The WIA's archive project, also mentioned in August *AR*, is much needed and should receive all the help and support it can. Well done WIA on moving on this most important project. History is so easily lost and or distorted.

Regards,

Will McGhie VK6UU

DX-News & Views

Chris Chapman VK3QB and Luke Steele VK3HJ

It's appropriate to open this month's column with a special note of thanks and appreciation for John VK4OQ who has diligently brought us news of DX happenings for the past seven years. Thanks John – we've been able to work a few new ones and stayed on top of DX news from your monthly updates. As your new *DX – News and Views* columnists we will aim to continue John's fine tradition and welcome any news, questions or general tips from the VK community. Over the coming months we hope to provide some additional information on how to maximise your DXing as well as hints and tips for new-comers.

Our first column has been a little rushed as we come to terms with the publishing cycle and deadlines, so next month we'll provide a brief introduction and bio. In the meantime we hope you enjoy the column and please drop either of us an email if you have any comments, suggestions or questions.

July and August

July continued the fairly unexciting propagation conditions from June. Mid July saw some strong solar activity, including a strong earth-directed solar flare, which counteracted the high solar flux somewhat. Apart from a few IOTA operations, including YE0M Kaliage Besar Island in Indonesia, the only other point of interest was the Sovereign Military Order of Malta operation, from Rome, and they didn't seem too interested in working VK! 20 metres has been opening on the long path into Europe most afternoons, and going into August, shows some very good signals both ways. Some long path signals from Africa have also been evident on 20 metres mid-afternoon. There's no shortage of 40 metre signals from North America and Asia during our evenings. 40 metre has also been good into Europe around sunrise. Conditions should continue to improve as we head out of winter, and higher in the solar cycle.

Fifty-three VK ops made the CY9M St Paul expedition log at the end of July. They had to QRT and leave the island a day early, and make a sea trip back to Sydney, Nova Scotia before some bad weather.

At the time of writing, John 9M6XRO and Steve 9M6DXX will be starting their Spratly Island expedition as 9M4SLL. This will be the third activation of this wanted entity this year, after some years of no activity.

Lakshadweep was activated for the ILH weekend as VU7M.

Also in the Indian Ocean, a team of European operators activated Grande Comore Island with the callsign D64K.

DX observations from around Australia are welcome, to complete the bigger picture. Otherwise the observations in this column may only represent the view from VK3.

Some upcoming DX operations

The following table below summarises some of the DX activations that may be of interest to VK operators.

NH8S **Swains Island**, a relatively new DXCC entity, should be a nice easy one to work from VK, from 5-18 September. The last major operation was in 2007.

E6 **Niue** will be activated by W7GJ on 6 m and 2 m EME from 7-21 September. ZL1RS will be also active on Niue on 6 m and 2 m from 8 September-15 November.

Date	Call	QSL via	Information
1-3 Sep	5R8VE	F4EZG	Nosy Alanana AF-090, 40, 20, 15, 10 SSB
2-10 Sep	FR/DF8AN	DF8AN	Reunion Island, mainly CW
5-18 Sep	NH8S	OQRS	Swains Island
6-12 Sep	3B8/IW5ELA	IW5ELA	Mauritius, mainly CW, holiday style
7-10 Sep	EA6	IZ4WNA, IZ4WNP	Ibiza Island, EU-004, SSB, PSK63
7-21 Sep	E6	TBD	Niue Island, W7GJ, 6 m, 2 m, EME
8 Sep – 15 Nov	E6	TBD	Niue Island, ZL1RS, 6 m, 2 m
13-17 Sep	JW8DW	LA78DW	Spitsbergen Island, Svalbard EU-026
13-17 Sep	XP2I	OZ1BII	Kangerlussuaq, Greenland. CW
18-23 Sep	HB0	ON4ANN	Liechtenstein, Belgian DXpedition
24 Sep-5 Oct	3D2C	YT1AD	Conway Reef, International DXpedition
26 Sep-1 Oct	VP2V	AA7V	British Virgin Island, VP2V/AA7V
29-30 Sep	CQ WW RTTY		
1-15 Oct	7Z7AB	7Z1CQ	Al-Dhahrah Island, AS-190 New
?1-31 Oct	TT8TT	I2YSB	Chad, DXpedition
16-23 Oct	3B9SP	HB9ACA	Rodrigues Island DXpedition
27-31 Oct	P29NI		PNG, Simberi Island, OC-099, then into November, Lihir, Buka and Manu Islands.
16-25 Oct	T30PY	OQRS, PY2PT	West Kiribati, Brazilian DXpedition
23-30 Oct	VP2MXU	G3NKC	Montserrat
10-22 Nov	PT0S	LOTW	St Peter and St Paul

XP2I will be the call used by OZ1BII from Kangerlussuaq, **Greenland** from 13-17 September. Henning will be active in the Scandinavian Activity Contest.

Liechtenstein, a semi-rare entity will be activated by a group of Belgian operators from 18-23 September. They will be operating as HB0/home calls. QSL via the Belgian bureau.

Conway Reef will be activated by a large group led by YT1AD, as 3D2C from 24 September – 5 October. Conway Reef is near Fiji, so will be a nice easy one for VK.

The CQ World Wide RTTY contest is on 29-30 September. Also look out for activity from the contest stations before and after the contest.

Chad will be activated by I2YSB and a team as TT8TT in October. This is a fairly rare one for VK, but this team, in previous operations, has been listening for VK/ZL from time to time.

Mali should be on air soon, courtesy of Fernando EA4BB. Nando is taking up a new assignment in the Mali Republic after operating for some time in Zimbabwe as Z21BB, and previously as 9Q5BB, D2BB, ST2BF, and TU5JL. His new call is likely to be TZ6BB. QSL via W3HNK.

Rodrigues Island will be activated in October by a group of Swiss operators as 3B9SP. This entity has been fairly regularly activated, but the last big expedition there was in 2004.

The CQ World Wide SSB contest is on 27-28 October. Look out for activity from the contest stations before and after the contest too.

An IOTA expedition to **Papua New Guinea's islands** will be starting on Simberi Island OC-099 as P29NI, from 27-31 October, then Lihir Island OC-069, from 2-4 November, then as P29VCX from Buka Island OC-135, from 6-9 November and Manu Is OC-025, from 9-12 November.

The **St Peter and St Paul Rocks** PT0S expedition will have a focus on the low bands. VK6 ops may have a chance to work them at the morning grey line, but in November the rest of VK will have no mutual darkness at all. Let's hope for some propagation on the higher bands. A previous announcement indicated that amateur radio activity would no longer be permitted from St Peter and St Paul, so make the most of this activation.

ZL9HR **Campbell Island**, IOTA OC-037, should be easy to work on most bands from VK, during the period 28 November – 9 December. This entity was last activated in January 1999, and is now very difficult to access due mainly to landing permissions and permits. Make the most of this one, as it may not be activated again for a long while. If you need ZL9, please consider making a donation to help with the significant costs – without our support many rare entities cannot be activated. See *http://www.zl9hr.com* for further information.

In other news, Ivica YU1YU may find less time for amateur radio, now he is **Serbia**'s new Prime Minister. Also, the ITU has announced a new prefix for **Niue**; formally ZK2, Niue is now E6A-E6Z.

Special thanks to the authors of The Daily DX, 425 DX News, DX World and QRZ.DX for information appearing in this month's column. Interested readers can obtain a free two week trial of The Daily DX from *www.dailydx.com/trial.htm*

Silent Key

Hugh Holmes VK3ATH

Hugh was born on 7 November, 1922 and became SK on 16 May, 2012.

He was educated at Essendon High School, and joined the Army, in Kajarena, WA, and served with the 2nd Field Ambulance. At eighteen and a half he transferred to the RAAF in Perth, eventually serving with them in Darwin as a radio technician.

He married Marian in 1946 and they had two children, John and Colin, and at the time of his death he had eight grandchildren and two great-grandchildren.

After the war Hugh attended night school at Melbourne Tech for ten years doing radio and electronics, worked for Pye Radio as Production Engineer and at one time had his own painting and decorating business. He later worked for 3AK as Radio Engineer and went to the Mullard/Phillips group as chief engineer salesman. He retired from there owing to ill health and finished his working days with 'Erni Electronics' working three days a week as their chief salesman.

He moved to Lockwood South in 1986 and had a house built there, and where he spent the remainder of his life.

He joined the Midland Amateur Radio Club and was a regular member at meetings and events until his poor health prevented him from attending. Hugh had been an amateur radio operator for the last 50 years.

Rest in peace Old Man.

Contributed by Ray Taylor VK3FQ with assistance from his wife Marian.

Contests

Phil Smeaton VK4BAA
e *vk4baa@wia.org.au*

Welcome to this month's Contest column.

A bumper edition this month, with a plethora of contest results to report.

BERU results

First cab off the rank - the results are out for BERU 2012. Team Australia came second, facing fierce opposition from all-comers. Many congratulations to the Team – VK2BJ, VK2PN, VK3TDX, VK4EMM and VK6LW.

CQ WPX CW 2011 results

Once again, VK was well represented in this contest, with the results showing the following VK stations on Table 1.

CQ WPX SSB 2011 results

VK was very well represented in this contest, with the numbers of submitted VK logs on the rise yet again. The published results show the following VK stations on Table 2.

IARU SSB 2012 contest

Just in time for the contest, a big sunspot AR1520 unleashed an X1.4-class solar flare. Because the sunspot is directly facing Earth, everything about the blast was geoeffective. For one thing, it hurled a coronal mass ejection (CME) directly toward our planet and caused a modicum of heartache for contesters.

John VK4EMM noticed a few anomalies on the bands, especially on 40 metres. Strong echo effects on signals were noted, which John attributes to back-scatter during the severe geomagnetic storm. John recorded part of the contest, which includes Vlad VK2IM enjoying a good run on 40 metres while Johns beam was pointing towards North America. The echo is very pronounced until 50 seconds into the recording, when John swung the beam towards VK2 – a bearing of approximately 160 degrees. While beaming to VK2, Vlad's signal is clean and crisp with no significant echo. Ten seconds later, the beam is swung back on NA and the echo effects are again very pronounced. This effect was pronounced on NA and JA stations.

Steve VK3TDX was having fun on the bands and had some fun regardless of the CME flare. The flare really slammed the hammer on propagation with K indexes as high as 8 in some northern locations and created an EU QSO party for many there with DX openings highly curtailed.

Contest Calendar for September 2012 – December 2012

September	1/2	All Asian DX Contest	SSB
	1/2	Region 1 Field Day	SSB
	8/9	Worked All Europe DX Contest	SSB
	29/30	CQWW RTTY DX Contest	RTTY
October	**6/7**	**Oceania DX Contest**	**SSB**
	13/14	**Oceania DX Contest**	**CW**
	20/21	Worked All Germany Contest	CW/SSB
	24/25	CQWW DX Contest	SSB
	24/25	ARRL International EME Competition	CW/SSB
	24/25	CQWW SWL Challenge	SSB
November	10/11	Japan International DX Contest	SSB
	10/11	Worked All Europe DX Contest	RTTY
	3/4	ARRL International EME Contest	All
	24/25	**Spring VHF/UHF Field Day**	**CW / SSB / FM**
	27/28	CQWW DX Contest	CW
	30	ARRL 160 m Contest	CW
December	1	RTTY Melee	RTTY
	15/16	ARRL 10 m Contest	CW/SSB
	21/22	OK DX RTTY Contest	RTTY
Dec 2012 to	**Jan 2013**	**Ross Hull Memorial VHF Contest (VHF/UHF)**	**CW / SSB / FM**

Note: Always check contest dates prior to the contest as they are often subject to change.

Call	Category	Score	QSOs	WPX	Hours
VK4CT	SO HP ALL	5,341,920	1,881	718	35.8
VK2IM	SO HP ALL	4,491,828	1,753	684	36.0
VK3TDX	SO HP ALL	2,905,500	1,331	596	29.9
VK2PN	SO HP ALL	665,448	622	357	28.4
VK7GN	SO HP ALL	528,360	483	296	14.0
VK8AV	SO LP 40M	129,944	159	148	7.6
VK2CCC	SO QRP 40M (T)	121,429	169	133	13.5
VK3FM	SO LP ALL	120,802	227	187	23.9
VK2CA	SA HP ALL (T)	77,322	173	147	10.3
VK4TT	SO LP ALL (T)	71,300	176	124	9.5
VK4FJ	SA LP 15M	39,900	128	114	17.5
VK2BNG	SA LP ALL (T)	37,824	118	96	12.4
VK4EJ	SO LP 15M	31,416	113	102	10.6
VK7NET	SO LP ALL	250	10	10	2.8
VK6DXI	SA LP 80M (T)	60	4	4	0.2

Table 1: CQ WPX CW 2011 results.

Call	Category	Score	QSOs	WPX	Hours
VK4KW	MULTI-TWO	26,528,482	5,756	1,369	46.3
VK4NM	MULTI-ONE	6,133,875	2,072	825	35.7
VK2IM	SO HP ALL	3,786,880	1,508	640	34.9
VK6NC	MULTI-ONE	2,897,063	1,408	703	28.3
VK4EMM	SO HP ALL	2,856,276	1,376	636	35.3
VK6IR	SA HP 15M (T)	2,263,494	1,252	654	29.2
VK2CA	SA HP ALL (T)	2,015,059	1,217	571	23.3
VK3TDX	SO HP ALL	1,989,376	1,073	608	26.8
VK1CC	MULTI-MULTI	1,608,491	956	563	28.1
VK4WIP	MULTI-ONE	1,252,649	876	509	16.9
VK3DOG	SO HP ALL (R)	212,930	293	214	22.2
VK3AVV	SO HP ALL	189,200	277	215	19.3
VK4VDX	SO LP ALL	168,696	255	213	16.9
VK6FDX	SO HP ALL	141,038	267	194	10.4
VK3MDX	SO LP ALL	116,272	212	169	16.2
VK3TZ	SO LP ALL	109,210	204	163	7.5
VK7NET	SO LP ALL	100,110	206	141	25.3
VK2HBG	SO LP ALL	98,596	203	157	25.8
VK4IU	SO HP ALL	81,780	202	141	8.0
VK1OO	SA LP ALL	72,765	160	135	15.1
VK4FJ	SO LP 15M	68,497	175	143	14.3
VK3LM	SO LP ALL	65,142	150	141	17.8
VK4XES	SO LP ALL (T)	63,512	147	136	16.0
VK2BCQ	SO HP ALL (T)	63,384	164	139	14.0
VK4DMP	SO LP 20M	56,823	150	141	9.8
VK6HAD	SO LP ALL	51,528	165	114	23.1
VK1MJ	SO HP ALL	39,710	106	95	4.7
VK2WTT	SO LP 20M	38,976	123	116	8.8
VK2ERP	SO HP ALL	30,694	121	103	19.7
VK2ACC	SO HP ALL	29,302	105	98	9.5
VK2WAY	SO LP ALL (T)	29,058	98	87	15.9
VK1PAR	SO LP ALL	28,644	97	84	10.7
VK4BL	SO LP ALL (T)	28,608	111	96	16.2
VK4ATH	SO QRP ALL	22,532	99	86	20.1
VK5MK	SO LP ALL	17,822	74	67	7.4
VK2FHRK	SO QRP ALL	12,201	55	49	6.6
VK4MN	SO LP 20M (T)	5,625	45	45	6.4
VK4QH	SO LP ALL	2,650	28	25	3.9
VK3VTH	SO LP 20M (R)	2,052	27	27	4.5
VK2HEK	SA LP ALL (T)	1,188	19	18	5.0
VK1MAT	SO LP 20M (R)	225	9	9	1.1
VK4FJAM	SO QRP ALL	48	6	6	2.5
VK6FMAB	SO LP ALL (R)	40	6	5	1.3
VK5FMPJ	SO LP 40M (R)	4	2	2	-
VK5FCJM	SO LP 15M	3	1	1	-

Table 2: CQ WPX SSB 2011 results.

However, from Steve's QTH there seemed to always be an open band somewhere and the activity was excellent from all directions. Steve reports that ten metres was very disappointing however as he didn't even hear the usual JA stations and nil from EU. 15 was so-so with the usual super stations coming through but never got a run going with the normally common EU 'back yard dipole' operators. 20 was a big band however with lots of surprises, with the long path openings being a good source of QSOs. Steve bagged just over 700 QSOs for a claimed score of around 750,000 points.

Mirek VK6DXI put his remote station facility to some good use during the contest. Mirek found 160 metres and 80 metres to be noisy. One extremely loud signal on 160 metres heard was from R3HQ (really big on all bands) which made Mirek think that he was a VK station! However, the receive capabilities of R3HQ didn't quite match-up to the TX side of things, making for several unanswered calls from DX stations. Mirek reports that 15 metres was the 'money band' for him, with some useful EU propagation on 10 metres also. As always, it depends on which on this bit of rock you located as to the DX arriving at your antenna. Mirek netted almost 1200 Qs for a claimed score of a smidge over one million points.

Vlad VK2IM reported that the band conditions were all over the place at his QTH. Vlad started okay, but things dried out pretty quickly and that there are better things to do at 2 am (1600Z) than making 20 Qs/hour! 40 metres was open to Asia only (bright daylight in EU and NA) and on 20 metres Vlad could not even hear half of the stations that John VK4CT was working. After a while, 20 metres opened LP to EU and SP NA with good signals reported. It was followed by 40 metres to NA. Vlad logged 1300 Qs for a claimed score of a tad over 1.1 million points.

Wes VK6WX was operating the super-station at VK6NC as a single operator, and managed to get just over 400 Qs into the log for a claimed score of a little over 237,000 points. He reported a high level of noise floor, but that might've been the beer fridge motor doing overtime and not the bands as such.

One reported aspect was not so rosy for this particular contest. It was reported by some stations that during the contest, some stations were heard to be operating outside the rules which limit the number of simultaneous signals permitted on the bands – just the one is permitted for M/S operation. However, I am sure some stations will push the envelope here and have a second station which is operating on the same band/mode as the 'run' radio. In order to prevent more than one transmitted signal at a time, some sort of interlocking system would have to be used. This would be fine and would be a competitive advantage without breaking the rules, forcing the station to only have one signal transmitted at any given time. However, it was noted by a number of participants that one very well-known multi-single station was clearly not using an interlock and had two independent stations running on each end of the band. There are recordings on the Net clearly showing two signals present very often at the same time. Faced with such evidence, it can only be hoped that the people who are responsible for these operations will offer to submit their log as a check log and not pollute their scores with those played by the wrong rules.

Well, in every aspect of life, there have been, are, and always will be cheaters. Two big aspects (historically) that motivate cheating are (a) others do it so I need to cheat as well in order to maintain a level playing field, and (b) What is the risk of getting caught? For ham radio events, there is likely to be a subset of (b) along the lines of... if I get caught, will the contest sponsor actually take any action? The sponsor (the ARRL) has been notified of what the various reporting stations heard - and they are working the issue to collect more data. Once they have good data - *and* the log is submitted - then they can present the data to the offending station and ask for an explanation. Obviously, if someone submits their log as a check log (or not at all) there is nothing wrong with what they are doing (at least from the perspective of the contest rules). It is also quite possible that this was a 'one off mistake', and with an appropriate explanation, perhaps the situation can be salvaged.

Over the years, the envelope has certainly been pushed to distortion over interpreting contest rules in some cases. Certainly it is interesting to see how far these things can go and stay within the rules. However, at some point, we might want to think about the effect this has overall on the category and if it discourages too many people from participating in the contest because they have no hope of being competitive with just a 'single' transmitter.

OCDX 2012 contest and 2011 results

The 2012 Oceania contest is almost on us, with the first two weekends of October putting our area of the world on centre stage. Once again, clubs are able to enter teams and have a go at competing for the VKCC Club award, and VK entrants need to remember to include the name of their club when submitting a log.

The Australia Club plaque is awarded to the local club from Australia with the greatest number of member stations participating in the contest. In order for a club to be eligible there must be at least five logs submitted by member stations, with each log containing a minimum of 50 valid QSOs. No clubs met this requirement in 2011. Rather than not making an award, the plaque sponsor (VKCC) decided that the plaque should be awarded to the Eastern and Mountain District Radio Club in Melbourne on the basis that this club was closest to meeting the eligibility requirement with a total of four logs (**VK3AVV** PH, **VK3QI** PH, **VK3TZ** PH and **VK3QI** CW) that met the 50 QSO criteria. The Lockyer Valley Radio and Electronics Club was runner up with two logs.

Photo 1: The Australia Club plaque awarded to the EMDRC for their 2008 OCDX contest participation – and repeated in 2011.

In order to facilitate the awarding of the Australia Club plaque in 2012 and future years, it is important that each VK entrant, who is a member of a local radio club, identifies the name of that club in their log (using the Cabrillo CLUB: field). The VKCC and OCDX contest committee will also be contacting the various clubs around Australia to encourage them to enter teams in the contest and have a go at winning the plaque.

Congratulations to all the 2011 winners. What a difference one year can make! After many years of hibernation the 10 metre band finally exploded back to life with more than 20% of the action in the 2011 contest occurring on this band. The low bands were in poor shape but this was more than offset by the great conditions on the higher bands. The 2011 OCDX contest was the biggest so far with a total of 1259 logs being submitted. This represents a 15% increase over the previous record of 1092 logs in the 2010 contest. In particular it was fantastic to see a huge (81%) increase in the number of logs submitted from North American stations. The increased activity can be attributed to excellent conditions on the HF bands, the efforts of the T32C and YJ0VK DX expeditions, and a growing awareness of the contest and the unique opportunity that it provides to work DX from the Oceania area. The participation of the T32C team in Eastern Kiribati was a huge draw card in the PHONE section and similarly, the

YJ0VK team in Vanuatu attracted a lot of interest in both the PHONE and CW sections.

New records were set by the following Oceania stations on Table 3.

Category	New record set by	2011 Score
Oceania PH MM	T32C	49651218
Oceania PH M2	VK4KW	12707916
Oceania PH M1	VK4NM	5214247
Oceania PH SO ALL LP	ZL1TM	1194914
Oceania PH SO 15 m HP	WH2X	951220
Oceania PH SO 10 m HP	VK6NC	646866
Oceania CW M1	VK4CT	4156851
Oceania CW SO ALL LP	ZL1TM	2067954
Oceania CW SO 10 m LP	VK4AN	360360

Table 3: OCDX 2011 results.

CQWW log submission changes

The contest committee for this contest recently announced a major change as regards log submissions: 'With the technology available today and the presence of the internet practically everywhere, it has been decided to reduce the log submission time for all CQ contests to five (5) days.

Your log should be sent to the appropriate robot within five (5) days after the end of the contest. Reviewing the submissions from last year's CQ WW DX contests, ~ 70% of all electronic logs were received within seven days after the contest. We realize that in some cases circumstances may not allow a timely submission. Requests for an extension must be received before the log submission deadline by sending an e-mail to *questions@cqww.com* The first CQ contest affected by this new log deadline will be the CQ WW RTTY contest taking place in September. It will be interesting to see how this pans-out, as the robot has been known to throw teddy out of the pram at times – even with a wider timespan for log submission to reduce the traffic. Some DXpeditions may or may not be able to comply as some areas, in fact, do not have Net access freely available and reliable. Time will tell, no doubt.

If you have any contest related material for inclusion within the column, topics that you'd like covered or even some experiences and pictures you'd like to share, then please feel free to get in touch via *vk4baa@wia.org.au* See you on the bands.

73 de VK4BAA Phil Smeaton.

RAOTC QSO Party 2012

All licensed Australian amateur radio operators are invited to participate in the annual QSO PARTY sponsored by the Radio Amateurs' Old Timers' Association Inc.

The event may be treated as a contest, or simply enjoyed as a basic contact occasion.

This event is sometimes referred to as the "Old Rigs Contest", because, as amateurs with many years' experience, many have older radios still in working order. Here is a good opportunity to give them an airing. However, do not feel afraid to use the latest "do everything" radio!

Date: Saturday 22 September 2012

Time: 0400 – 1200 UTC

The **object** will be to make as many contacts as possible, especially with members of RAOTC.

Bands will be 160, 80, 40 and 20 metres.

Modes: CW, AM, SSB

Suggested Frequencies:

- 160 metres AM 1843 kHz, SSB 1850 kHz
- 80 metres CW 3520 kHz, SSB 3570-3590 kHz
- 40 metres CW 7020 kHz, SSB 7080-7090 kHz
- 20 metres CW 14040 kHz, SSB 14160-14170 kHz

Exchange callsigns; serial number starting at 001 and incrementing by one for each contact, whether RAOTC member or not.

Score

- one point per contact
- add 25 points to total score if using a radio 25 years or more old

Logs must show callsign of station worked, time, mode, exchange sent and received, callsign, name and postal address of operator submitting log, whether using an older radio or not.

Send Logs to: Secretary, RAOTC, PO Box 107, Mentone, Vic, 3194 or via email to *raotc@raotc.org.au* by Friday, 28th September, 2012.
If sending by email and no acknowledgment is received, please resend.

Certificates will be issued to:

- scorer with highest total contacts;
- highest scorer using an old rig;
- highest scorer on each band;
- highest scorer in each mode

Find these Rules on the Web: *www.raotc.org.au*

The Westlakes Cup Contest 2012

Date: 15 September 2012. **Time:** 1030 UTC to 1130 UTC

Band: 3.535 to 3.620 MHz. **Mode:** SSB, DSB, AM

Maximum Power: 100 Watts Standard and Advanced licences, 10 Watts Foundation Licences

Rules: All stations to call "CQ Westlakes Cup." Exchange shall be operator's name and a signal report.

After a contact is made and reports exchanged, the station that had called "CQ" must QSY at least 5 kHz before calling again. There will be no sitting on a frequency and working a "pile up."

Valid Contacts: Only VK or special prefix (AX, VI) Australian stations may be worked.

Points A: There will be two BONUS stations operating in the contest. The BONUS stations are those that hold the cup from last year's contest. The BONUS stations are worth 1 point for the QSO plus 3 bonus points and may be worked twice, once in each half hour. For 2012 the BONUS stations will be VK7VH/BONUS and VK2FHRK/BONUS.

Points B: Amateur Radio Club stations taking part are worth 1 point for the QSO plus 1 bonus point. Club stations may only be worked once.

Points C: All other stations are worth 1 point and may only be worked once.

Points D: SWLs can claim the same points as transmitting stations.

Contest Procedure: At 1015 UTC on 3.585 MHz +/-QRM, BONUS station VK2FHRK shall make an announcement outlining the contest rules and greeting participants. Any questions will be answered at this stage.

Contest Logs: Should contain the following: **Cover Sheet** showing the entrant's call, name, station address, email address (optional), points claimed, and the declaration, "I declare I have operated within the rules and spirit of the contest and in compliance with my licence conditions."

The Log should show: UTC time station worked, call and name of operator of station worked, and exchanged signal reports.

Awards: Inscribed cups shall go to the stations with the highest points - one cup for the Standard/Advanced section winner and one cup for the Foundation section winner. The two winners will be the BONUS stations for next year's contest. Certificates will be awarded to first, second, and third place getters in each section, (Standard/Advanced, Foundation, and SWL.)

Logs should be sent to: The Contest Manager, Westlakes Amateur Radio Club, PO Box 3001 TERALBA N.S.W. 2284
or by email to: *contestmanager@westlakesarc.org.au*

The closing date for logs is Saturday 27 October 2012.

David Myers VK2RD
Contest Manager
Westlakes Amateur Radio Club Inc.

The 2012 ZL9HR DXpedition to Campbell Island

Ed Durrant VK2ARE – Australian Publicity Officer

The team at the Hellenic Amateur Radio Association of Australia are pleased to announce that the landing permit for the ZL9HR DXpedition to Campbell Island (IOTA OC-037) has been issued by the New Zealand Department of Conservation.

The DXpedition will take place between the 28th of November and the 9th of December, 2012. An international team is being assembled for this event on the sub-Antarctic Campbell Island (IOTA OC-037).

This will be the biggest DXpedition by an Australian club in 25 years and the biggest one in 2012 worldwide.

For all information please go to the DXpedition website at *ZL9HR.com*

The proposed QSL card design for the ZL9HR DXpedition.

Winter VHF-UHF Field Day 2012: Results

Contest manager: John Martin VK3KM

The Winter Field Day was quieter than usual, with a total of 51 logs received. Many entrants reported cold weather which reduced the number of active stations. One interesting feature is that this is the first Field Day where VK2 stations have won three sections - and it is also the first event in which VK3 stations have won none.

It was good to see an increase in activity by Foundation licensees in the single operator sections. They will receive an extra "F Call Challenge" certificate.

Congratulations to the section winners Matt Hetherington VK2DAG, Steven Harrison VK2XDE, the Sunshine Coast club VK4WIS, Keith Minchin VK5AKM, and Justin Lavery VK2CU. And congratulations to all.

The next Field Day will be the Spring event on November 24/25.

Call	Name	Location	50 MHz	144 MHz	432 MHz	1296 MHz	2.4 GHz	3.4 GHz	5.7 GHz	10 GHz	24 GHz	47 GHz	TOTAL
Section A:	**Single Operator, 24 Hours**												
VK2DAG	Matt Hetherington	QF47, QF48	71	327	415	576	720	710	710	710	710	-	4949
VK5ZD	Iain Crawford	PF85, PF95	21	258	440	608	720	720	750	660	550	-	4717
VK5KK	David Minchin	PF94, PF95	34	261	430	632	720	600	620	440	430	-	4167
VK5TX	Ben Hennessy	PF85, PF95	21	306	430	632	540	-	440	-	-	-	2369
Section B:	**Single Operator, 8 Hours**												
VK2XDE	Steven Harrison	QF57, QF58	71	216	360	576	720	710	710	710	720	-	4793
VK5ZD	Iain Crawford	PF85, PF95	-	234	385	472	570	470	600	440	330	-	3501
VK5KK	David Minchin	PF94, PF95	23	213	345	424	480	370	390	440	430	-	3115
VK5OQ	Keith Gooley	PF95	22	153	195	184	-	230	230	-	-	-	1014
VK3YFL	Bryon Dunkley-Smith	QF22	34	159	240	296	-	-	-	210	-	-	939
VK4ADC	Doug Hunter	QG61	43	285	285	288	-	-	-	-	-	-	901
VK5FDCA	Dominic Giles	PF94, PF95	-	204	320	-	-	-	-	-	-	-	524
VK5AR	Alan Raftery	PF95	-	151	225	-	-	-	-	-	-	-	376
VK2EH	Colin Matten	QF56	36	180	120	-	-	-	-	-	-	-	336
VK1AI	Greg Parkhurst	QF44	24	117	125	-		-	-	-	-	-	266
VK3FEZZ	John Witte	QF22	-	111	120	-	-	-	-	-	-	-	231
VK2WFD	CCARC (VK2ARE)	QF56	23	75	120	-	-	-	-	-	-	-	218
VK3FDBB	Daniel Bird	QF22	-	135	-	-	-	-	-	-	-	-	135
VK2ZMC	James Cleary	QF57	-	105	-	-	-	-	-	-	-	-	105
Section C:	**Multi Operator, 24 Hours**												
VK4WIS	SCARC	QG63	101	510	505	496	-	-	-	-	-	-	1612
VK2BOZ		QF68	46	507	255	400	-	-	-	-	-	-	1208
VK1MT		QF44	42	207	170	-	-	-	-	-	-	-	419
VK2HZ	BMARC	QF56	27	162	115	-	-	-	-	-	-	-	304
Section D:	**Multi Operator, 8 Hours**												
VK4IZ	RDRC	QG62	54	264	270	288	-	-	-	210	-	-	1086
VK2BOZ		QF68	33	387	230	360	-	-	-	-	-	-	1010
VK2MB	MWRS	QF56	28	159	150	168	-	-	-	-	-	-	505
VK5GRC	NERC	PF95	32	162	185	-	-	-	-	-	-	-	379
Section E:	**Home Station, 24 Hours**												
VK5AKM	Keith Minchin	PF95	24	138	270	504	360	480	480	-	-	-	2256
VK3GL	Graeme Lewis	QF21	87	540	645	456	-	-	-	-	-	-	1728
VK5MK	Mark Hutchinson	PF94	22	291	415	488	-	-	-	-	-	-	1226
VK3MY	Ross Keogh	QF22	72	330	420	400	-	-	-	-	-	-	1222
VK4VDX	Roland Lang	QG62	48	312	415	384	-	-	-	-	-	-	1159

Call	Name	Location	50 MHz	144 MHz	432 MHz	1296 MHz	2.4 GHz	3.4 GHz	5.7 GHz	10 GHz	24 GHz	47 GHz	TOTAL
Section E:	**Home Station, 24 Hours (cont.)**												
VK3WT	Max Chadwick	QF22	61	303	390	400	-	-	-	-	-	-	1154
VK3KH	Michael Coleman	QF21	39	300	365	416	-	-	-	-	-	-	1120
VK3HY	Gavin Brain	QF22	67	342	320	352	-	-	-	-	-	-	1081
VK4KLC	Ron Melton	QG62	81	387	465	-	-	-	-	-	-	-	933
VK4AMG	George McLucas	QG62	52	279	255	256	-	-	-	-	-	-	842
VK5KC	David Clegg	PF94	33	138	225	352	-	-	-	-	-	-	748
VK3AVV	Mike Subocz	QF22	49	342	260	-	-	-	-	-	-	-	651
VK1KW	Robert Quick	QF44	27	348	200	-	-	-	-	-	-	-	575
VK3SMC	Simon McClure	QF22	37	186	265	-	-	-	-	-	-	-	488
VK4CZ	Scott Watson	QG62	63	153	250	-	-	-	-	-	-	-	466
VK2XN	Wayne Fouracre	QF59	-	228	160	-	-	-	-	-	-	-	388
VK3FASW	Andre Walker	QF21	-	192	190	-	-	-	-	-	-	-	382
VK4TGL	Gerard Lawler	QG62	39	177	140	-	-	-	-	-	-	-	356
VK3FCAA	Keith McDougall	QF22	-	129	110	-	-	-	-	-	-	-	239
VK2ACL	Matt Maguire	QF56	21	66	110	-	-	-	-	-	-	-	197
VK3ZHQ	Eric Warren-Smith	QF22	-	171	-	-	-	-	-	-	-	-	171
VK2AMS	Mark Swannack	QF68	6	33	35	56	-	-	-	-	-	-	130
VK5FMLB	Matthew Bonser	PF94	-	36	65	-	-	-	-	-	-	-	101
Section F:	**Rover Station, 24 Hours**												
VK2CU	Justin Lavery	QF58, QF57, QF48, QF47, QF69, QF59, QG50	94	534	755	1120	960	960	960	960	960	-	7303
VK5ZT	Tim Dixon	PF85, PF94, PF95, PF96	-	255	395	648	770	760	770	660	640	-	4898

Notes

VK1MAT	Matthew Bowman VK1MAT, Shane Goodwin VK1MAD
VK2AWX	Hunter Radio Group: VK2SH Geoff Wrightson, VK2FWJL Wayne Lawrence, VK2FERM Craig Murnane, VK2OI Michael Clarke, VK2FA Grahame O'Brien, VK2VV Graham Brice, VK2CLH Charles Hunt
VK2BOZ	Cris Perrett VK2BOZ, Doug Tufrey VK2FWWD, Brenda Taylor VK2FSMI
VK3ALB	Lou Blasco VK3ALB, Nik Presser VK3BA, Peter Westgarth VK3APW, Jenni Blasco VK3FJEN, Michael Blasco VK3FMIC
VK3YVG	Yarra Valley Amateur Radio Group: VK3ABJ, VK3PPC, VK3DAC, VK3VWW, VK3HKB
VK3BJA	Gippsland Gate ARC: Mike Ide VK3KTO, Graham Brown VK3BXG
VK4IZ	Redliffe and District Radio Club: Kevin Johnston VK4UH, Colin Hutchesson VK5DK/4
VK4WIE	City of Brisbane Radio Socviety: VK4MJF, VK4KSY, VK4CRO, VK4NE, VK4FABD
VK4WIS	Sunshine Coast ARC: Glenn VK4FSCC, Richard VK4RY, Ches VK4WT, Bill VK4XZ, Geoff VK4KEL, David Carr
VK5LZ	Elizabeth ARC: VK5ADE, VK5KX, VK5AKH

Participate

September 8 **SUNFEST 2012 Sunshine Coast Amateur Radio Club**
At Woombye School of Arts, Blackall Street, Woombye, QLD

September 9 **SADARC Hamfest 2012 Shepparton and District ARC**
St Augustines Hall, Orr Street, Shepparton, VIC

September 21-23 **ICOM D-Star QSO Party**
http://www.icom.co.jp/world/d-starparty2012/

VK7news

Justin Giles-Clark VK7TW
e *vk7tw@wia.org.au*
w *groups.yahoo.com/group/vk7regionalnews/*

Cradle Coast Amateur Radio Club

The biggest amateur radio news in VK7 in recent times has to be the very well planned and executed helicopter battery replacement on Mt Duncan for the VK7RMD repeater. This all took place on 8 July 2012 with the new batteries and housing being air lifted up to the site and the old batteries and junk being air lifted back down the mountain. A big thank you to all involved, it is a huge credit to you. There are photos and video available on the CCARC web site at: *http://my-x15.net/ccarc/page11.html*

Winston VK7EM also let the author know that the DATV repeater VK7RMM destined for Mt Montgomery in North West VK7 is progressing well. The bench testing performed by Winston and Dion VK7DB has seen the first pictures being repeated through it from 1250 MHz analogue and transmitted on 446.5 MHz DVB-T with a temporary repeater controller connected.

Photo 1: Some of the crew helping on top of Mt Duncan, from left: Steve VK7FXXX, Steve ex VK7FWWF, Steve VK7NZL, Caroline, Geoff VK7ZGW and Dion VK7DB. Photo courtesy of VK7EM.

Northern Tasmania Amateur Radio Club

By all account the presentation on Radio Direction Finding that Jason VK7ZJA gave the Northern club was a big hit. Jason works for Optus and spends much of his time tracking down interference using radio direction finding techniques. Jason started with an explanation of CDMA and WCDMA and went on to a very entertaining description of how he eventually tracked down interference emanating from the Hobart ABC TV studios where an intermittent device in a cupboard was being affected by temperature, air conditioning and meetings...HI HI. A big thank you to Jason.

Photo 2: Here is the full crew that helped on Mt Duncan: Back row: Dion VK7DB, Peter, Dick VK7DIK, Peter VK7PD, Caroline. Middle row: Steve ex VK7FWWF, Winston VK7EM, Geoff VK7ZGW. Front: Steve VK7FXXX, Steve VK7NZL. Photo courtesy of VK7NZL.

Radio and Electronics Association of Southern Tasmania

We congratulate Tony de la Bere from Howrah who successfully gained his Standard licence recently. We should be hearing Tony on air very soon.

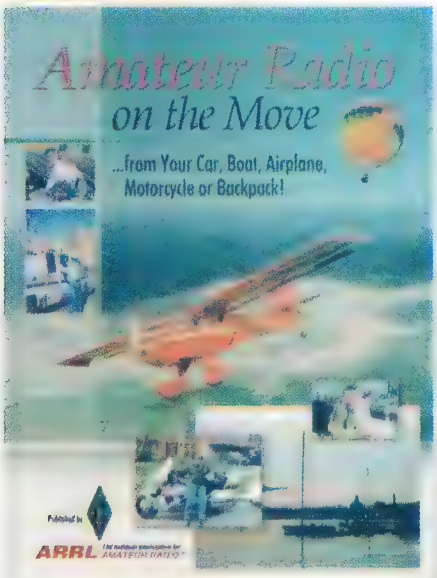
REAST's July presentation was given to us by Jim Palfreyman who has just finished his thesis for a Masters in Astrophysics – studying pulsars using the radio telescope at Mt Pleasant. Pulsars provide accurate pulses and Jim spent four years studying the Vela pulsar around 1400 MHz that pulses around 700 Hz and emits electromagnetic radiation across the spectrum from X-rays to the visible.

Jim also has a passion for accurate time and he assists in looking after the University of Tasmania's hydrogen maser atomic clock. He has also built his own atomic clocks using parts from eBay which keep his clocks accurate and this includes the old Hobart 'Speaking Clock'. Jim demonstrated he was a keen hacker and homebrewer which went down well with the large group that came along to hear the presentation. Thanks Jim for a very enlightening presentation.

Photo 3: Jim Palfreyman explaining his homebrewing experiments getting the Speaking and Pendulum clocks atomic locked! Photo courtesy of VK7TW.

Our DATV Experimenter's nights have been treated to a video summary of the 2012 GippsTech microwave conference, including a 10 GHz preamp, power amplifiers, ARDF, SOTA, DUBUS magazines, and Jan King W3GEY/VK4GEY video compliments of Peter VK3PF. A great big thank you to Rick VK7FRIK who has very generously donated video equipment including an LCD video monitor wall which replaces our CRT monitor wall and substantially cuts down the amount of power we use in the DATV Studio.

Visit our Bookshop



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VK3 news Amateur Radio Victoria

Jim Linton VK3PC
e *arv@amateurradio.com.au*
w *www.amateurradio.com.au*

Who does what?

The first meeting of Council after the Annual General Meeting elects and appoints those who are to serve the organisation for the coming year.

Council in accordance with the Constitution elected Barry Robinson VK3PV as President, the Vice President Peter Mill VK3APO, and taking on the dual roles of Secretary and Treasurer, Ross Pittard VK3CE.

In other appointments: Tony Hambling VK3VTH – Contests and Awards; Terry Murphy VK3UP – Events and Deceased Estates; Keith Proctor VK3FT – Radio masts; Peter Cossins VK3BFG – ATV matters and classes; Gary Furr VK3FX – Internet Project Development and Jim Linton VK3PC – Publicity.

Barry VK3PV is also the Team Leader of Education which includes Kevin Luxford VK3DAP/ZL2DAP as the Class Instructor.

Peter VK3APO is responsible for repeaters and beacons, plus he oversees the strategically placed Mt Stanley site re-building after the 2009 Black Saturday Bushfires.

In addition there is a band of volunteers who open the office weekly and maintain the QSL Bureau, headed by John Brown VK3FR.

Meetings with speakers introduced

In response to the interest shown Council has introduced quarterly meetings where members can come along and listen to expert speakers on various topics.

The first meeting was held in August with popular presenter Mark Tell from the ACMA.

The next meeting will be on Tuesday November 13, then February 10 during next year's Centre Victoria RadioFest No 6, and the Annual General Meeting on May 14, 2013.

The speaker nights start at 8 pm and are held at 40g Victory Boulevard, Ashburton. Put the dates in your calendar now and support this initiative.

RadioFest planning begins

Council has already begun with its review and planning for the Centre Victoria RadioFest to be held at the Kyneton Racecourse on Sunday, February 10, 2013.

Preliminary discussion involved the mini-lecture program headed by Peter Cossins VK3BFG and who can take part. Thought has been given to what new activities to include in the major event of its kind in Victoria.

The logistics and other matters will be on the agenda and if any member has ideas or wishes to be involved they should contact the Secretary, Ross Pittard VK3CE.

The bookings will open later in the year for the Traders Hall, Second-hand market places, and Club Corner.

KRMNPA update

Further Keith Roget Memorial National Parks Awards have been issued to claimants who have supplied proof of contact through an extract of their logs.

KRMNPA Manager Tony Hambling VK3VTH reports having sent two certificates with the tally now being nine for 15 or more Victorian National Parks activated or worked. One of those and the first from interstate came from David Giles VK5DG of Mount Gambier, South Australia. David VK5DG has told us he received the operating award and it looks pretty good on the shack wall.

Next class session

Enrolments are open for the Foundation licence training and assessments to be held on September 22nd and 23rd. These highly successful courses are held at the centrally located Amateur Radio Victoria office at 40G Victory Boulevard, Ashburton. For enrolment or more details please contact Barry Robinson VK3PV via email *foundation@amateurradio.com.au* or telephone 0428 516 001.

Silent Key

John Laurence Martin ex VK2II

John Laurence (Laurie) Martin passed away on 22 July, 2012.

He was educated at Auckland Grammar School and completed a radio course at Johnson Radio College in 1935. He started work assembling crystal radios then went to sea as a RO. He later transferred to Tasman Empire Airways. After the war he spent two years flying around China in DC3s. He then joined BCPA and Qantas. His original call sign was ZL2IS.

Laurie was an avid inventor and made his own TV. As he could not afford the picture tube, it was listened to for quite a while! He serviced radios and TVs for friends and neighbours.

He was a long-time member of the WIA and entered in many competitions – among them, 1983 when he competed in the RD contest, finishing in 3rd place in section B (CW/RTTY). He was also a member of the RAOTC. He did Morse code in his sleep and hence his nickname was 'Banger'.

Submitted by Kevin Stannard, formerly VK2JCY, now proudly VK2II.

AMSAT

David Giles VK5DG
e *vk5dg@amsat.org*

Stop him someone – he's going historical!

This month we dwell back on the past by looking at some of the resources available for those with a sense of history. Collections are available to download for AMSAT's journals, newsletters and bits of AMSAT's story covered in other magazines of amateur and computing interest.

During the past year various milestones for AMSAT have been reached. Such as 50th anniversaries of OSCAR-I and OSCAR-II's launches and 10 years since AO-7 came back to life. Another milestone occurs next month. Reading back on the experiences and techniques of those who were involved with satellites in those pioneering days has shown how far we have come. It's much easier these days to find the satellites by just downloading a tracking program and getting it to fetch the latest Keplerian elements. But just as the Internet has made tracking easy, it also provides us with a large repository of historical documents so people like me that weren't part of the early years of AMSAT can see how it started and developed.

AMSAT's own

Phil Karn KA9Q is a familiar name in the AMSAT community as he has been involved in quite a few missions. His latest contribution was the BPSK telemetry on ARISSat-1. On his website he has collated copies of AMSAT newsletters and journals from 1969 to 1987, from several sources as well as his own collection. These include *'The AMSAT newsletter', 'AMSAT satellite report', 'AMSAT Orbit' magazine, 'AMSAT Technical journal'*, and the *'AMSAT Journal'*. The period covers from OSCAR-6 through to OSCAR-13. [1]

Amateur magazine

The biggest collection I have found is the complete set of *73* magazine. Published from 1960 to 2003 by Wayne Green, *73* magazine focussed on the technical side of amateur radio. It featured many articles on amateur satellites and had regular columnists. The earliest construction article I found was from February 1965 – a VXO for a 2 metre radio to use with the upcoming OSCAR-III transponder. But the next issue had 'An orbit computer for OSCAR III'. This piece of ingenuity consisted of a globe of the world with a wire around it representing OSCAR-III's proposed orbit and various markers to assist in locating OSCAR-III. No personal computers in those days and amateurs were kept up to date using HF to exchange observations. I won't be listing every satellite article in 73 magazine but there were some issues devoted mainly to satellites. Those I have found are July 1975, November 1977, May 1988, and May 1989. Most issues have an AMSAT column but the best were from Andy MacAllister WA5ZIB (later WA5ACM). His regular column ran from January 1987 through to the last issue in September 2003. Possibly the most complicated satellite project described was the AutoTrak (July 1977) and its follow up AutoTrak-II (January 1979). This device could track one satellite (or the moon) and control azimuth and elevation rotators. It was designed with discrete logic and phase locked loops for all the timing; no microprocessor in sight. There are quite a few articles on computer aided tracking with program listings. There are annual indexes in the December or following January issues. Even so you may have to do some extra searching for OSCAR related articles for some years. The total archive is about 17 Gigabytes. [2]

Computing magazine

Perhaps the final bit of inspiration for this column came from a less likely source. I was pointed towards a collection of the magazine *Byte*. *Byte* was an American computer magazine that ran from 1975 to 1998. I used to read it at the library during the 80s (Circuit Cellar was always a favourite column) so missed out on the early issues and the later ones. But there are some articles from and about AMSAT in there. The March 1975 issue mentions tracking OSCAR in an article about amateur radio. In the September 1976 issue AMSAT presented a debug monitor for an 8080 based computer. This piece of software (six pages long of 8080 assembly language taking about 1.5 k of memory) was enough to allow you to enter and debug machine code programs via a terminal. The following month had ham radio as its theme with a selection of articles mainly on using a computer to do CW. Before the ill-fated launch of P3A, Dr Karl Meinzer presented an article describing IPS in the January 1979 issue. IPS was the language he developed that was used for the software on the Phase-3 OSCARs themselves and their control stations. The last AMSAT article I have found is in the September 1979 issue and describes the

AMSAT-Golem-80 computer. The Golem-80 used commercial S-100 cards for processor, memory and some I/O but AMSAT's contribution was to add the software for amateur applications (satellites, RTTY, CW etc) and specialised hardware such as modems. Must end here with a warning – some of these files are very large (up to 450 MB). [3]

Final Pass

This column was inspired by two nostalgic events. On a recent trip to VK1 I visited the Honeysuckle Creek tracking station site for the first time. It is now a historical relic as the buildings no longer exist and the dish was moved to the Tidbinbilla Deep Space Network site just up the road. Its main claim to fame is that it was the tracking station that received the first pictures from the moon by the Apollo 11 astronauts.

The second event is that the first draft of this column was typed up on a 30 year old Microbee computer that was recently donated and I am currently restoring. Many of the early magazines mentioned in this article also give insight into the early days of hobbyist computing when memory was in kilobytes and processor speed in single digit Megahertz.

References

[1] *http://www.ka9q.net/newsletters.html*

[2] *http://archive.org/details/73-magazine*

[3] *ftp://helpedia.com/pub/archive/temp/Byte/*

AMSAT-VK

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Group Moderator
Judy Williams VK2TJU
email secretary@amsat-vk.org

Website
www.amsat-vk.org

Group site:
group.amsat-vk.org

About AMSAT-VK

AMSAT-VK is a group of Australian amateur radio operators who share a common interest in building, launching and communicating with each other through non-commercial Amateur Radio satellites. Many of our members also have an interest in other space based communications, including listening to and communicating with the International Space Station, Earth-Moon-Earth (EME), monitoring weather (WX) satellites and other spacecraft.
AMSAT-VK is the primary point of contact for those interested in becoming involved in amateur radio satellite operations. If you are interested in learning more about satellite operations or just wish to become a member of AMSAT-Australia, please see our website.

AMSAT-VK monthly net
Australian National Satellite net

The net takes place on the second Tuesday of each month at 8.30 pm eastern time, that is 0930 Z or 1030 Z depending on daylight saving. The AMSAT-VK net has been running for many years with the aim of allowing amateur radio operators who are operating or have an interest in working in the satellite mode, to make contact with others in order to share their experiences and to catch up on pertinent news. The format also facilitates other aspects like making 'skeds' and for a general 'off-bird' chat. In addition to the EchoLink conference, the net will also be available via RF on the following repeaters and links.

In New South Wales
VK2RMP Maddens Plains repeater:146.850 MHz
VK2RIS Saddleback repeater: 146.975 MHz
VK2RBT Mt Boyne Repeater on 146.675 MHz

In Queensland
VK4RIL Laidley repeater on 147.700 MHz
VK4RRC Redcliffe 146.925 MHz IRLP node 6404, EchoLink node 44666

In South Australia
VK5TRM, Loxton on 147.125 MHz
VK5RSC, Mt Terrible on 439.825 MHz IRLP node 6278, Echolink node 399996

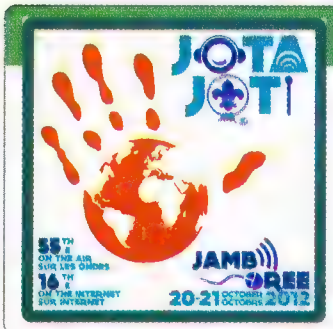
In Tasmania
VK7RTV Gawler 6 m. Repeater 53.775 MHz IRLP node 6124
VK7RTV Gawler 2 m. Repeater 146.775 MHz. IRLP node 6616

In the Northern Territory
VK8MA Katherine 146.700 MHz FM

Operators may join the net via the above repeaters or by connecting to EchoLink on either the AMSAT-NA or VK3JED conferences. The net is also available via IRLP reflector number 9558. We are keen to have the net carried by other EchoLink or IRLP enabled repeaters and links in order to improve coverage. If you are interested in carrying our net on your system, please contact Paul via email. Frequencies and nodes can change without much notice. Details are put on the AMSAT-VK group site.

Become involved

Amateur satellite operating is one of the most interesting and rewarding modes in our hobby. The birds are relatively easy to access and require very little hardware investment to get started. You can gain access to the FM 'repeaters in the sky' with just a dual band handheld operating on 2 m and 70 cm. These easy-to-use and popular FM satellites will give hams national communications and handheld access into New Zealand at various times through the day and night.
Should you wish to join AMSAT-VK, details are available on the web site or sign-up at our group site as above. Membership is free and you will be made very welcome.



Plan NOW for JOTA/JOTI 2012!

Contact your local **Scout** or **Guide** group.

The **55th Jamboree On The Air** will take place on 20 and 21 October 2012.

This year's theme is: How big is your world?

VK3news

Tony Collis VK3JGC

Geelong Amateur Radio Club - The GARC

The GARC presentation syllabus

With the exception of the monthly General Meeting, the GARC Syllabus Coordinator Lou VK3ALB provides the membership with presentations directly and indirectly connected with amateur radio, by club members and external sources. Below are four such presentations delivered this year.

Law and Order

Amongst the recent indirect presentations was the second in the series dealing with Civil and Criminal law in Australia, given by Ian VK3BFR. These talks have been extremely thought provoking in the manner in which the Australian state judicial systems operate, particularly contrasting certain *'rigid'* attitudes to law in America; whereas Australia accepts that in some areas there are *legal* shades of grey, for instance, in the acquisition of evidence *'illegally'*, dependant on the severity of the crime.

An introduction to SDR

By contrast Lou VK3ALB recently gave a presentation on a simple introduction to Software Defined Radio (SDR), a feature that is now embedded in a lot of commercial amateur radio equipment, but is also gaining in popularity with constructors.

Conventional communication receivers have followed a fairly standard pattern over the years with multiple conversion stages, a high degree of screening with the design being fixed and in general being both bulky and heavy as well as expensive.

The characteristics of SDR however are significantly different, in that:

- It can work in conjunction with a notebook PC equipped with a stereo sound card ideally with a sampling rate of 48 kHz or above; on screen this will also function as a panoramic adapter.
- It is relatively simple to build using a single conversion to base band audio such as the Soft Rock 40 single band kit.
- In this configuration it is the software, and usually freeware, that defines the radio's parameters.
- The commercial plug-in units for SDR are usually under $100.
- It is now possible to get SDR on a Samsung Galaxy 2 phone, with the gISDR Android app by Alex Lee Shing Cheung.

The detailed power point presentation covering this topic may be found on the GARC website at *www.vk3atl.org* under Home Page/Syllabus/Notes from previous presentations.

Measurement of VSWR

Chas VK3PY, in a series of presentations, has demonstrated in a clear objective manner the way in which forward and any reflected voltages on a transmission line interact.

In the latest presentation Chas, with the aid of David VK3QM's 3.4 GHz transmitter, a slotted coaxial cable terminated with an N connector mounted on a vernier slide, with a voltage detector coupled to a meter; showed that with a 50 ohm plug/ termination, the meter showed a flat line voltage over, what were, a couple of wavelengths at 3.4 GHz This represents a Vmax/Vmin of 1:1 signifying a perfect match of line to load. Changing the termination to a T piece with two 50 ohm plugs (25 ohm load) showed a Vmax of twice the Vmin, cyclically over the same length of coax, giving a VSWR of 2:1. This demonstration would be of considerable interest to those training for their Foundation licence.

Magnetism, gravity and climate control

Possibly the most controversial presentation the GARC has ever sponsored was by Thomas Watson entitled **'A Challenge to Flemings Continual Magnetic Flow Rule and of the Theory of Gravity'**. Watson discussed an *extremely* detailed PowerPoint presentation regarding the positive harmonic relationship between the electrons and their nucleus for all natural atomic structures. From this connection, he developed a simple formula that determines the atomic gravity, as a relationship between its magnetic activity for all natural atomic structures. It is this activity, he believes, that science will eventually identify as being the probable connection between the magnetic fields from the earth to the sun's magnetosphere that also facilitate on-going climate change processes.

Watson asserts that one event, with which amateurs are familiar, is the switching of the sun's polarity, which happens on average every 11 years This event is also well known within climatic science and is referred to as the Milankovitch Cycles. It relates to the earth's orbital variations, which over thousands of years, accumulate to allegedly produce the changes in climatic conditions that we witness today.

Hamads

WANTED - NATIONAL

Copies of *Australian CQ* magazine.

The WIA Archive is seeking early copies of the late 1920s Australian CQ for copying and/or adding to the WIA Archive's shelves.

This magazine was published by the NSW Division of The Australian Radio Transmitters League, a group which was initially formed in 1927 in Queensland and grew quite large in NSW. Later it established itself to some extent in most Australian States. The magazine possibly ceased publication in late 1929 when ARTL members in NSW re-united with the WIA. The WIA Archive holds only one complete copy and one part copy of this magazine. In addition, a small number of copies are held by ARNSW and the Kurrajong Radio Museum. Collectively, we wish to build up the issues extant.

The format was fourteen printed pages stapled; each page approximately 150 mm wide x 220 mm height. A coloured cover was included although the colour seems to have changed with each year of publication.

Please contact Peter VK3RV via email *vk3rv@wia.org.au* or c/o the National Office in Bayswater if you can help us locate this important part of our history.

WANTED - NATIONAL

The WIA Archive is seeking a copy of ***Radio Broadcasting Technology*** by John F. Ross.

This book covers 75 years of Radio Broadcasting History in Australia between 1923 and 1998. It primarily covers Commercial and ABC broadcasting, but also contains some information about activities of early amateur broadcasters.

This is a hard covered, substantial book, approximately A4 page size and has 600 pages. It was privately published and so had very limited circulation. The WIA Archive would like to obtain a copy to complement other books held by the institute covering early Australian broadcasting and communications.

Please contact Peter VK3RV via email *vk3rv@wia.org.au* or c/o the National Office in Bayswater if you can help us locate a copy of this important book.

FOR SALE - VIC

I would rather give it away than dump it, so this is FREE. National Electronic organ. Top G# working but others are not working. Has a 50 W (peak) solid state amplifier, 1 x 25 cm speaker, 2 x 20 cm speakers, 1 x 2.8 cm speaker, 73 IC's, 254 transistors (including 11 Fets), 408 diodes. Also plenty of useful parts if you don't want to repair it. Pick up from Cohuna.

Contact Norm VK3JAL, phone 03 5456 3122.

Kenwood two metre FM TX, TR7950,S/N 4070886. Unused, and in original package. $300.

AWA RT80 TX, model IM82002, S/N 203733, 148-174 MHz, complete with control unit. Unused, and in original packaging, $200.

Philips (TCA) TX, FM1677C/25, S/N 7626, complete with mounting hardware, Suitable for conversion to ham band, $100.

VK Powermaster power supply, 13.8 V, 20 A, $150.

Contact Bill Adams VK3ZWO, QTHR or at *waadams@dodo.com.au*

I have for sale one Henry 1kd5 linear amplifier. Included is lots of information on the unit, plus the operating and maintenance manual. Also included is a spare '3-500Z' and spare tuning charts and information.

I have never used this amplifier since I purchased it almost a year ago, but I always turned it on and let it run for an hour or so each week to keep the tube in good shape. This is a very heavy unit, thus pickup would be advised; however, you pay for the post if required. The unit looks clean for its age.

Asking price is $550.00 with a spare 3-500Z tube and all paper work.

Contact Cliff VK3CB, phone 03 5346 1534.

FOR SALE - NSW

FT-1000MP, and FL-7000 amplifier, $3,500.00.

Contact David VK2AYD on 02 6585 2647 or on *dvdplly@midcoast.com.au*

WANTED - ACT

A printer compatible with Tono and/or Telereader series. Or information about same to assist in a purchase.

Contact Fred Ryan VK1RY QTHR or on phone 02 6247 9886, or by email to *fwnryan@tpg.com.au*

FOR SALE - SA

ESR Meter parts – Complete parts kit, $69.95 plus postage. Order on-line from Aztronics Pty Ltd, 170 Sturt St, Adelaide, 5000. Phone 08 8212 6212 or at *www.aztronics.com.au*

PCB only, $10.00 plus postage. Order on line from VK5JST, *www.users.on.net/~endsodds*

Contributions to Amateur Radio

AR is a forum for WIA members' amateur radio experiments, experiences, opinions and news.

Your contribution and feedback is welcomed.

Guidelines for contributors can be found in the *AR* section of the WIA website, at *http://www.wia.org.au/members/armag/contributing/*

Email the Editor:
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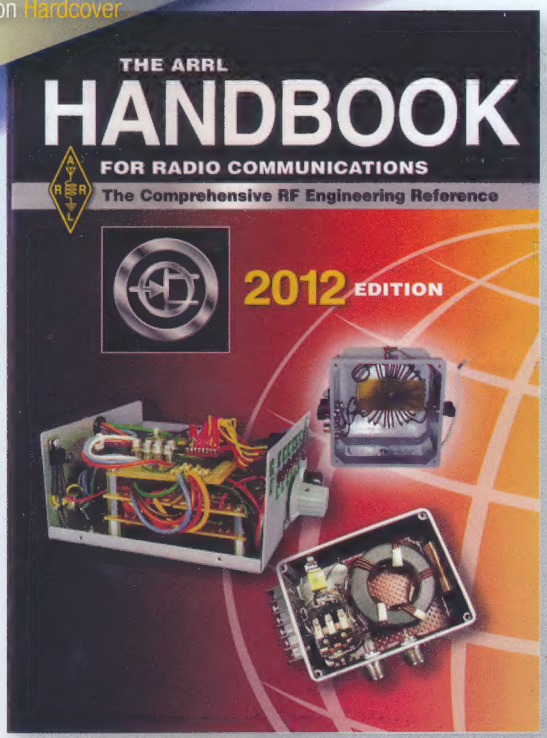

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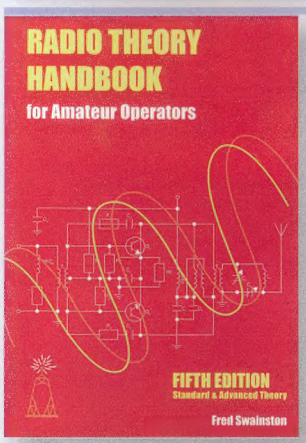

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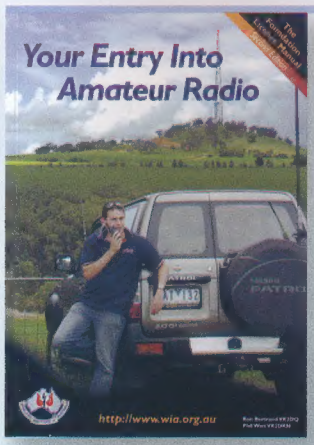

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